HEALTH RISK BEHAVIORS IN THE STATE OF MICHIGAN

2006 BEHAVIORAL RISK FACTOR SURVEY
20TH ANNUAL REPORT

Michigan Department of Community Health

M DCH

2006 Behavioral Risk Factor Survey

Health Risk Behaviors in the State of Michigan

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This report presents estimates from the 2006 Michigan Behavioral Risk Factor Survey (BRFS), a statewide telephone survey of Michigan residents aged 18 years and older. It is the only source of state-specific, population-based estimates of the prevalence of various behaviors, medical conditions, and preventive health care practices among Michigan adults. The survey findings are used by public health agencies, academic institutions, non-profit organizations, and others to develop programs to promote the health of Michigan citizens.

All the results from the 2006 Michigan BRFS presented in this report have been weighted as described in the methods section and can be interpreted as estimates of the prevalence rates of various health risks among the general adult population of Michigan.

		National Estimates	
Selected Risk Factors	**Michigan Estimates (%)**	**Median (%)[a]**	**Range (%)[b]**
Health Status Fair or Poor	15.2	14.7	10.8 - 32.9
Overweight (BMI 25.0 - 29.9)	36.1	36.5	32.1 - 39.6
Obese (BMI ≥ 30.0)	28.7	25.1	18.2 - 31.4
No Health Care Access During Past 12 Months Due to Cost	12.0	17.0	8.5 - 32.7
No Leisure-Time Physical Activity	22.8	22.8	41.2 - 14.2
Current Smoking	22.1	20.0	8.9 - 28.5
Heavy Drinking	4.9	4.9	2.0 - 7.9
Binge Drinking	17.5	15.3	8.5 - 24.2
Mammogram in Past 2 Years (Women 40+ Years Old)	79.9	76.5	61.3 - 84.8
Pap Test in Past 3 Years (Women 18+ Years Old)	82.6	84.0	72.3 - 89.4
Blood Stool Test In Past 2 Years (50+ Years Old)	27.5	24.1	5.1 - 32.5
PSA Test Within The Past Two Years (Men 40+ Years Old)	56.9	53.8	40.0 - 65.7
Ever Had a Sigmoidoscopy or Colonoscopy (50+ Years Old)	66.3	57.1	37.8 - 69.2
No Dental Visit In Past Year	25.4	29.7	42.0 - 19.5
Flu Shot in Past Year (65+ Years Old)	71.8	69.1	33.1 - 75.9
Ever Had a Pneumonia Vaccination (65+ Years Old)	67.7	66.8	29.5 - 74.7
Current Asthma	9.5	8.4	4.5 - 10.5
Ever Told Diabetes	9.0	7.5	5.3 - 12.1

[a] The median value of the prevalence estimates compiled from 50 U.S. states, two territories, and Washington, D.C. that participated in the 2006 BRFS.
[b] The lowest and highest prevalence estimates among the states, Washington D.C., and U.S. territories that participated in 2006.

Summary, continued

Public Health Implications of Findings

A number of themes emerge from the findings of the 2006 Michigan Behavioral Risk Factor Survey that have implications for public health.

✄ Overall health status is not improving.

The BRFSS health status indicators, which are reflective of overall mental and physical well being of the population, have been level or shown deterioration in the health of Michigan adults. In 2006, 15.2% of Michigan adults were estimated to be in fair or poor health versus 13.1% in 1997. Furthermore, the percentage of adults with a disability showed a 20% increase between 2001 and 2006, with nearly one-in-four adults now estimated to be limited in any activities or to use special equipment due to a health problem. The Department has received a new grant from the Centers for Disease Control and Prevention to address health promotion among people with disabilities in Michigan. A portion of these funds will allow for the inclusions of questions regarding the impact on caregivers in the 2008 Michigan BRFS.

✄ Disparities exist in the majority of risk behaviors, preventive care measures, and disease prevalence.

The overall health status indicators described above highlight the segments of the Michigan adult population experiencing disparities in health, **including older adults, females, blacks, adults with less than college education, and those living in lower income households**. A notable exception to this pattern is seen for the indicator of mental health, with the prevalence of poor mental health decreasing with age and showing little variation by race-ethnicity. Young adults are more likely to report a lack of health care coverage, no personal health care provider, no routine checkup in the past year, and binge drinking. Black adults are more likely to report lack of health coverage, dental visits in the past year, and adult immunizations, no personal health care provider, no leisure time physical activity, current smoking, obesity, and having been diagnosed with diabetes. Adults without a college education or who live in lower income households experience disparities on virtually all risk indicators measured by the BRFS.

These disparities point to a need to integrate public health action across disease areas to focus on vulnerable populations and to better understand the synergetic effects of experiencing high rates for multiple risk factors and diseases. The MDCH Michigan Primary Care Initiative, undertaken to resolve the major system barriers that impede the delivery of preventive services and limit the optimal management of chronic disease in primary care settings, is one example of efforts to integrate public health action.

✄ Access to health care is an increasing problem.

In 2006, an estimated 14.6% of Michigan adults aged 18-64 had no health care coverage, an increase from 9.8% in 1997. **Given that adults without coverage are less likely to access health care services and delay getting needed attention, this increasing lack of coverage heightens the need for public health focus on primary and secondary prevention, making public health services even more important for the well being of Michigan adults.** For example, people who lack health insurance coverage are younger and more likely to smoke than those with insurance. Public health programs that provide services to the uninsured, such as the Smokers Quit Kit and Quit Line, Breast and Cervical Cancer Programs, and the Influenza Vaccine Exchange Network, are crucial to partially fill this gap.

An additional element of access is having a medical home in which someone is able to receive timely and culturally competent care. The 2006 BRFS findings indicate that adult men and black adults are more likely to report that they have no personal health care provider. In addition, there is a racial disparity in the proportion of adults reporting that they had a routine check up in the last year. The MDCH Health Disparity Reduction and Minority Health Program has a program with Molina Healthcare of Michigan to encourage black males to see their primary care provider.

✄ Missed opportunities for preventive screening.

Survey findings also indicate that Michigan adults are not receiving optimal preventive care, such as cancer screenings. Even a significant percentage of adults who had had a check up during the past year were not screened for cancer. MDCH has a number of outreach programs designed to increase access to and use of screening for breast, cervical, prostate, and colorectal cancers.

Summary, continued

Use of the Michigan Behavioral Risk Factor Survey

BRFS data continue to be used in planning and evaluating programs, establishing program priorities, developing specific interventions and policies, assessing trends, shaping legislation, addressing emerging public health issues, and targeting relevant populations. Notable examples include:

- Estimates of arthritis prevalence and related disability by county and region were mapped against location of Arthritis Foundation programs to *assess reach and need*, valuable information for making target decisions for new intervention programs within the state.

- The Diabetes Prevention and Control Program used BRFS to determine population-based estimates for key clinical indicators of diabetes management in order to set priorities and identify disparities. About one-half of all diabetes data requests received by MDCH are honored by using BRFS data. BRFS is the *only source of estimates* for required annual CDC reporting of clinical indicators.

- BRFS data compose 11 of 42 indicators for the Health Policy, Regulation and Professions Administration's *Michigan Critical Health Indicators Report,*[1] which supports policy making and program planning by stressing the use of outcome indicators to measure improvement.

- A variety of BRFS data (screening rates for breast, cervical, colorectal, and prostate cancers, and adult smoking rates) *benchmark progress* towards the 10 Michigan Cancer Consortium priority objectives.[2] BRFS data are used by the Cancer program to assess time trends in cancer screening and adult smoking rates back to 1990s *to evaluate cancer programs*.

- BRFS provides opportunity to add questions on *emerging issues*. For example, public beliefs about the family health history and awareness of genetic testing were assessed for the first time in Michigan using BRFS. BRFS questions about the emerging link between the Human Papilloma Virus and cervical cancer are currently being considered as a possible method to measure public awareness of this association.

- BRFS data on health seeking behaviors for African-American men are used to help in *program planning* for the Health Disparity Reduction Program's "Check Up or Check Out" initiative. BRFS data for five racial-ethnic groups are used extensively in reporting by the program.

- The Adult Oral Health Program uses BRFS data to monitor of trends in access to oral health services and factors related to not receiving services. BRFS provides most adult information within Michigan's oral health surveillance system including high-risk populations (seniors and persons with diabetes).

In addition, MI BRFS data are used extensively for external presentations and publications. For example, in the last two years more than 10 posters were presented at state and national conferences on subjects such as Epilepsy, Health Care Access, Knowledge of Stroke and Heart Attack Risk Factors and Warning Signs, Family Health History, Binge Drinking, and the Michigan Asthma Call-Back Survey. In addition, BRFS data have been used in over 18 articles by Michigan staff and researchers, including publications on work-related asthma prevalence, chronic disease-related behaviors and health among African Americans and Hispanics, variations in physical activity and diet, knowledge of stroke risk factors and warning signs, use of folic acid among women of reproductive age, and prevalence of aspirin use to prevent heart disease.

Future of the Behavioral Risk Factor Survey

The 2007 Michigan BRFS is expected to yield 1,500 more completed interviews (7,500 total) than the 2006 survey, with an African-American over sample as well. The survey will include 118 state-added questions on 18 topics, such as arthritis management, oral cancer screening, mental illness and stigma, osteoporosis, and various tobacco-related issues.

The surveillance system continues to adapt to challenges and expand its utility. For example, the random-digit dialing methodology of the Michigan Behavioral Risk Factor Survey is becoming increasingly problematic because of declining participation rates and the increased use of cell phones and other communication modalities, rather than a traditional land line telephone.[3] The BRFS will need to adapt in order to continue providing representative estimates for adults. Efforts are underway to increase response rate through use of advance notice mailings. However additional modalities must be explored, such as surveys of cell phone users, to keep the BRFS estimates valid.

Efforts have been made to expand the range of subpopulations covered by the BRFS data:

- The 2007 survey methodology over samples geographic areas with a high density of African-American residents in

order to provide more precise estimates for this population. Similar methodology could be used to increase the participation of Hispanic adults in the survey in the future.

- Since 2005, questions have been included to randomly select one child in each household and obtain demographic characteristics of that child. This information allows us to ask health-related questions about this child and then to calculate estimates for childhood conditions, such as asthma.

- An Asthma Call-Back survey that follows up on children and adults who were identified as having asthma during the BRFS interview has been conducted since 2005, allowing for collection of more detailed information on asthma management, clinical care, and impact of the disease on people's lives. It is anticipated that this methodology could be useful for other diseases and conditions in the future. The CDC has provided funding to some states to conduct in-person, follow-back surveys on specific diseases of interest. The Michigan BRFS has the potential to be used as a launching point for health examination surveys of adults identified as having risk factors for cardiovascular diseases or diabetes. In-person interviews and testing could provide more information about undiagnosed disease and the accuracy of self-reported data.

In conclusion, the Michigan Behavioral Risk Factor Survey continues to serve the needs of public health officials, health care providers, researchers and local and state level policy makers, while presenting a number of opportunities for expanding our understanding of the risk factors and preventive behaviors for the major causes of disease and disability in Michigan.
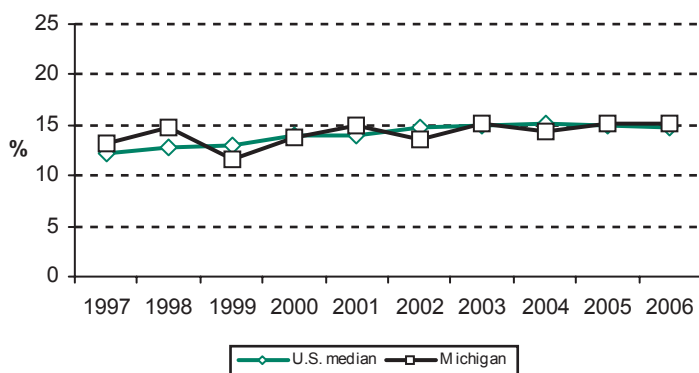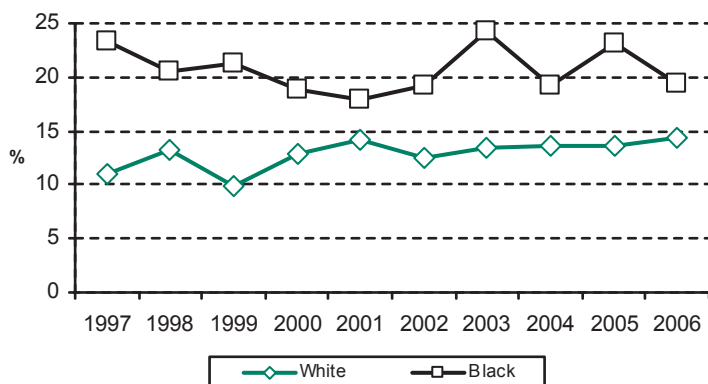
General Health Status

General health status is a reliable self-rated assessment of one's perceived health, which may be influenced by all aspects of life, including behaviors, environmental factors, and community.[4] Self-rated general health status is useful in determining unmet health needs, identifying disparities among subpopulations, and characterizing the burden of chronic diseases within a population.[5] The prevalence of self-rated fair or poor health status has been found to be higher within older age groups, females, and minorities, and has also been associated with lower socioeconomic status in the presence or absence of disease.[5]

In 2006, an estimated 15.2% of Michigan adults perceived that their general health was either fair or poor. This proportion increased with age from 10.1% of those aged 18-24 years to 30.0% of those aged 75 years and older. The proportion who reported fair or poor health decreased with increasing education and income levels. Blacks in Michigan have consistently had a higher prevalence than whites.

	General Health Fair or Poor [a]	
Demographic Characteristics	%	95% Confidence Interval
Total	**15.2**	**(14.2 - 16.4)**
Age		
18 - 24	10.1	(6.9 - 14.6)
25 - 34	9.4	(6.9 - 12.7)
35 - 44	11.5	(9.4 - 14.1)
45 - 54	14.7	(12.7 - 17.1)
55 - 64	19.1	(16.6 - 21.9)
65 - 74	23.3	(20.1 - 26.8)
75 +	30.0	(26.3 - 33.9)
Gender		
Male	14.4	(12.8 - 16.3)
Female	16.0	(14.6 - 17.4)
Race/Ethnicity		
White non-Hispanic	14.4	(13.3 - 15.6)
Black non-Hispanic	19.4	(15.7 - 23.8)
Other non-Hispanic	18.4	(13.1 - 25.2)
Hispanic	14.7	(8.4 - 24.3)
Education		
< High school	32.8	(27.5 - 38.5)
High school grad	20.1	(18.0 - 22.4)
Some college	13.2	(11.5 - 15.2)
College grad	7.3	(5.9 - 9.0)
Household Income		
< $20,000	32.6	(28.6 - 36.8)
$20,000 - $34,999	23.5	(20.5 - 26.8)
$35,000 - $49,999	13.6	(11.0 - 16.6)
$50,000 - $74,999	7.3	(5.5 - 9.4)
≥ $75,000	4.7	(3.5 - 6.3)

[a] The proportion who reported that their health, in general, was either fair or poor.

General Health, Fair or Poor
U.S. vs. Michigan, 1997-2006

Over the past 10 years, the proportion of Michigan adults who reported fair or poor health has been relatively constant and similar to the U.S. median.

The prevalence of fair or poor health was higher among adults who were not currently married compared with those who were married (age-adjusted estimates: 19.8% [17.9-21.9] vs. 13.7% [11.6-16.0]). Among younger adults (aged 18-54 years), the age-adjusted prevalence of fair or poor health was higher among those with no children in the household compared with those with children (14.5% [12.0-17.3] vs. 10.0% [8.4-11.9]), as well as among non-married adults compared with those currently married (16.4% [14.1-19.1] vs. 10.7% [8.0-14.0]).

General Health, Fair or Poor by Race
Michigan 1997-2006

Quality of Life

"Health-related quality of life reflects a personal sense of physical and mental health and the ability to react to factors in the physical and social environments."[4] The literature indicates that younger adults tend to experience a higher number of days of poor mental health than physical health, but the opposite seems to be true for older adults.[6-7]

An estimated 11.0% of Michigan adults had experienced physical health that was not good during at least two weeks of the past month. This proportion was higher among older adults than younger adults. Women were more likely than men to have experienced physical health that was not good (12.4% vs. 9.6%). This proportion decreased with higher education and income levels.

The proportion of Michigan adults who had mental health that was not good on at least 14 days in the past month was estimated to be 10.9%. This proportion was lower among older age groups, and women were more likely than men (13.2% vs. 8.4%) to report that their mental health was not good. This proportion decreased with higher education and income levels.

The proportion who reported that either poor physical heath or poor mental health kept them from doing their usual activities (such as self-care, work, and recreation) on at least 14 of the past 30 days was 6.8% (6.1-7.6). This proportion was lower among younger age groups, and women were more likely than men (7.9% [7.0-9.0] vs. 5.6% [4.6-6.8]) to report that their activities were limited by poor physical or mental health. This proportion decreased with higher education and income levels.

In 2006, the average number of days per month a Michigan adult did not have good physical health was 3.7, for mental health the average was 3.6 days, and for activities limited the average was 2.2 days.

Two additional indicators related to quality of life, i.e., life satisfaction and emotional support, are also available. Nearly six percent (5.7% [5.0-6.5]) of Michigan adults were estimated to be dissatisfied or very dissatisfied with their lives. This indicator decreased with increasing levels of education and income. Seven percent (7.0% [6.2-7.9]) were estimated to rarely or never get the social and emotional support they need. The prevalence of inadequate social and emotional support was higher for men than women (8.3% [6.9-9.8] vs. 5.8% [4.9-6.8]), and also decreased with increasing levels of education and income.

Demographic Characteristics	Physical Health Not Good [a]		Mental Health Not Good [b]	
	%	95% Confidence Interval	%	95% Confidence Interval
Total	11.0	(10.2 - 12.0)	10.9	(9.9 - 11.9)
Age				
18 - 24	3.1	(1.5 - 6.3)	12.1	(8.5 - 16.9)
25 - 34	5.4	(3.7 - 7.7)	12.8	(9.9 - 16.3)
35 - 44	8.3	(6.6 - 10.4)	10.0	(8.2 - 12.1)
45 - 54	13.1	(11.2 - 15.4)	12.2	(10.3 - 14.5)
55 - 64	17.6	(15.2 - 20.3)	12.0	(9.9 - 14.4)
65 - 74	16.1	(13.2 - 19.3)	6.6	(5.0 - 8.7)
75 +	20.1	(17.0 - 23.6)	6.6	(4.8 - 8.9)
Gender				
Male	9.6	(8.3 - 11.1)	8.4	(7.0 - 10.0)
Female	12.4	(11.2 - 13.6)	13.2	(11.9 - 14.6)
Race/Ethnicity				
White non-Hispanic	11.1	(10.1 - 12.1)	10.4	(9.4 - 11.5)
Black non-Hispanic	12.5	(9.6 - 16.0)	11.7	(8.8 - 15.5)
Other non-Hispanic	11.4	(7.8 - 16.5)	16.4	(10.6 - 24.3)
Hispanic	5.9	(3.1 - 11.1)	12.1	(6.7 - 20.8)
Education				
< High school	19.8	(15.7 - 24.5)	17.4	(12.9 - 23.0)
High school grad	13.9	(12.2 - 15.8)	13.3	(11.5 - 15.4)
Some college	10.0	(8.5 - 11.7)	11.7	(10.0 - 13.7)
College grad	6.8	(5.6 - 8.3)	5.8	(4.6 - 7.2)
Household Income				
< $20,000	22.9	(19.6 - 26.6)	20.0	(16.5 - 24.0)
$20,000 - $34,999	16.3	(13.8 - 19.1)	13.2	(10.8 - 16.1)
$35,000 - $49,999	8.7	(6.9 - 11.0)	12.1	(9.6 - 15.1)
$50,000 - $74,999	6.9	(5.3 - 8.9)	7.7	(6.0 - 9.9)
≥ $75,000	5.5	(4.3 - 7.0)	6.5	(4.9 - 8.6)

[a] The proportion who reported 14 or more days of poor physical health, which includes physical illness and injury, during the past 30 days.
[b] The proportion who reported 14 or more days of poor mental health, which includes stress, depression, and problems with emotions, during the past 30 days.

Disability

One Healthy People 2010 goal is to "promote the health of people with disabilities, prevent secondary conditions, and eliminate disparities between people with and without disabilities in the U.S. population."[8] There are many ways in which disability can be defined, ranging from experiencing difficulty in participating in certain activities (such as lifting and carrying objects, seeing, hearing, talking, walking or climbing stairs) to having more severe disabilities that require assistance in personal care needs (i.e., bathing) or routine care needs (i.e. housework).[9] Disability in the MI BRFSS is defined as either being limited in any activities because of physical, mental, or emotional problems, or having any health problems that required the use of special equipment (such as a cane, a wheelchair, a special bed, or a special telephone).
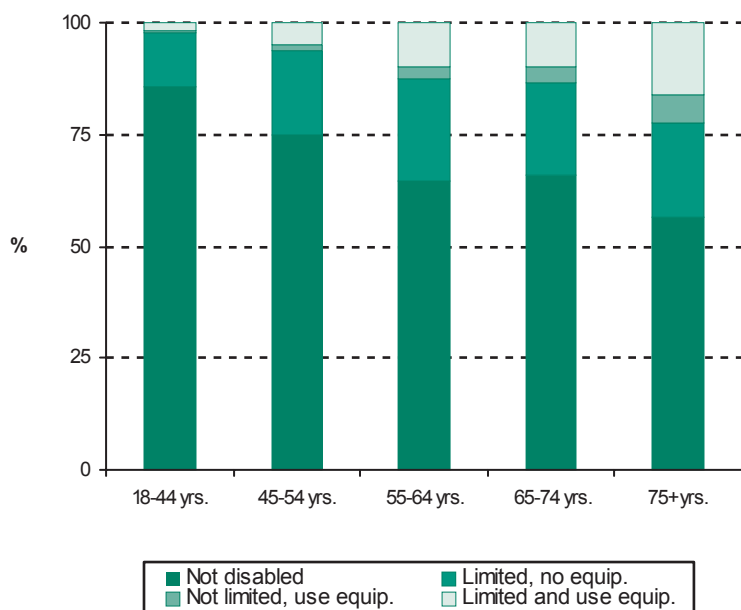
An estimated 23.9% of Michigan adults were living with a disability in 2006, compared with 19.5% (18.1-20.9) in 2001. The proportion who had a disability increased with age from 12.5% of those aged 18-24 years to 44.1% of those aged 75 years or older. Women where more likely than men (25.9% vs. 21.7%) to have a disability. The proportion of adults who had a disability declined with higher education and income levels.

The estimated proportion of Michigan adults who were limited in any activities was 22.1% (20.9-23.4), and the proportion who used special equipment due to a health problem was 7.3% (6.6-8.0). An estimated 76.4% (71.9-80.5) of those who used special equipment due to a health problem also reported being limited in any activities.

Demographic Characteristics	Total Disability [a]	
	%	95% Confidence Interval
Total	23.9	(22.6 - 25.2)
Age		
18 - 24	12.5	(8.9 - 17.4)
25 - 34	14.5	(11.5 - 18.1)
35 - 44	16.0	(13.6 - 18.7)
45 - 54	25.2	(22.6 - 28.0)
55 - 64	35.3	(32.3 - 38.4)
65 - 74	34.4	(30.7 - 38.3)
75 +	44.1	(40.0 - 48.2)
Gender		
Male	21.7	(19.8 - 23.8)
Female	25.9	(24.3 - 27.5)
Race/Ethnicity		
White non-Hispanic	24.1	(22.8 - 25.5)
Black non-Hispanic	21.4	(17.6 - 25.7)
Other non-Hispanic	27.7	(21.1 - 35.5)
Hispanic	20.0	(12.6 - 30.2)
Education		
< High school	33.3	(27.9 - 39.1)
High school grad	26.2	(23.9 - 28.6)
Some college	24.8	(22.5 - 27.3)
College grad	17.8	(15.9 - 19.9)
Household Income		
< $20,000	44.5	(40.1 - 49.0)
$20,000 - $34,999	30.8	(27.6 - 34.2)
$35,000 - $49,999	21.4	(18.4 - 24.8)
$50,000 - $74,999	16.9	(14.4 - 19.7)
≥ $75,000	13.6	(11.7 - 15.8)

[a] The proportion who reported being limited in any activities because of physical, mental, or emotional problems, or reported that they required use of special equipment (such as a cane, a wheelchair, a special bed, or a special telephone) due to a health problem.

In 2006, Michigan adults with disabilities were more likely than those without to have 14 or more days of physical health that was not good (33.1% [30.4-35.8] vs. 4.2% [3.6-5.0]), mental health that was not good (22.7% [20.2-25.4] vs. 7.2% [6.3-8.3]), and activity limitation (23.6% [21.2-26.1] vs. 1.6% [1.2-2.1]).

Disability by Age Group and Severity
Michigan, 2006

Legend:
- Not disabled
- Limited, no equip.
- Not limited, use equip.
- Limited and use equip.

Obese and overweight adults are at a higher risk than adults who are at a healthy weight to develop chronic conditions, such as high blood pressure, diabetes, gallbladder disease, osteoarthritis, and high cholesterol.[10] In Michigan, obesity-related medical expenditures have been estimated to be $2.9 billion in 2003 dollars.[11] Overweight is defined as having a body mass index (BMI) between 25.0 and 29.9; an obese weight status is a BMI greater than or equal to 30.0. BMI is defined as weight in kilograms divided by height in meters squared (w/h^2) and was calculated from the self-reported height and weight measurements of Michigan residents participating in the 2006 BRFS.

An estimated 28.7% of Michigan adults were obese in 2006, compared with 25.5% (24.0-26.9) in 2004. The proportion of adults who were obese increased with age from 15.5% of those aged 18-24 years to 35.1% of those aged 55-64 years, and then decreased to 19.7% of those aged 75 years and older. Blacks were more likely than whites (38.8% vs. 26.6%) to be obese.

Obesity by Race
Michigan, 1997-2006
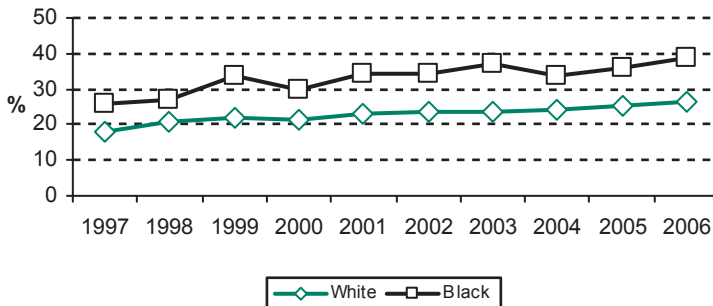
In 2006, an estimated 36.1% (34.5-37.6) of Michigan adults were overweight, having a BMI between 25.0 and 29.9. This proportion increased with age from 27.5% (21.8-34.0) of those aged 18-24 years to 40.3% (36.2-44.5) of those aged 75 years and older. Men were more likely than women (43.0% [40.5-45.6] vs. 29.2% [27.4-31.0]) to be overweight. The cumulative proportion of obese and overweight Michigan adults was 64.8% (63.2-66.3).

Michigan has consistently had higher obesity prevalence rates than the U.S. median. In 2006, the State of Michigan had the fifth highest obesity level among all participating states and territories.

Demographic Characteristics	Obese [a]	
	%	95% Confidence Interval
Total	**28.7**	**(27.3 - 30.2)**
Age		
18 - 24	15.5	(11.1 - 21.2)
25 - 34	29.9	(25.6 - 34.5)
35 - 44	29.8	(26.5 - 33.3)
45 - 54	32.1	(29.0 - 35.3)
55 - 64	35.1	(31.9 - 38.3)
65 - 74	34.8	(30.9 - 38.9)
75 +	19.7	(16.6 - 23.3)
Gender		
Male	30.2	(27.9 - 32.7)
Female	27.2	(25.5 - 29.1)
Race/Ethnicity		
White non-Hispanic	26.6	(25.1 - 28.2)
Black non-Hispanic	38.8	(33.4 - 44.4)
Other non-Hispanic	36.7	(28.9 - 45.3)
Hispanic	31.1	(21.6 - 42.5)
Education		
< High school	29.2	(23.9 - 35.0)
High school grad	32.4	(29.7 - 35.2)
Some college	29.4	(26.8 - 32.2)
College grad	23.8	(21.4 - 26.5)
Household Income		
< $20,000	33.9	(29.7 - 38.4)
$20,000 - $34,999	34.7	(31.1 - 38.6)
$35,000 - $49,999	30.5	(26.8 - 34.5)
$50,000 - $74,999	28.8	(25.4 - 32.4)
≥ $75,000	23.5	(20.8 - 26.5)

Note: BMI, body mass index, is defined as weight (in kilograms) divided by height (in meters) squared [weight in kg/(height in meters)^2]. Weight and height were self-reported. Pregnant women were excluded.
[a] The proportion of respondents whose BMI was greater than or equal to 30.0.

Obesity
U.S. vs. Michigan, 1997-2006
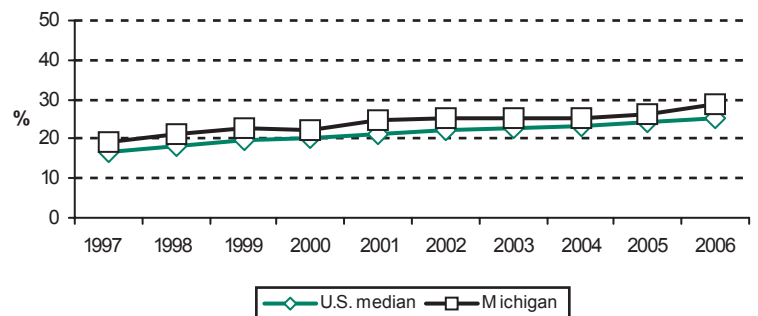
No Health Care Coverage

Adults who do not have health care coverage are less likely to access health care services, including preventive care, primary care, and tertiary care, and delay getting needed medical attention.[12-13] Utilization of preventive health care services, such as mammography, pap tests, prostate exams, influenza vaccinations, and cholesterol tests, could reduce the prevalence and severity of diseases and chronic conditions in the United States.[12-13]

In 2006, an estimated 14.6% of Michigan adults aged 18-64 years had no health care coverage. This proportion decreased with age from 29.7% of those aged 18-24 years to 7.9% of those aged 55-64 years. Blacks were more likely to have had no insurance compared with whites (20.8% vs. 13.1%). The proportion who were uninsured decreased with education and income levels.

The highest non-coverage rates were found among younger persons, those with less education, and those in low-income households. When lack of health insurance was examined more closely among those aged 18-29 years, it was found that 26.6% (22.4-31.3) of this age group were without health insurance and that the same inverse relationships existed with education and household income. The proportion with no health insurance decreased from 33.8% (26.9-41.3) among 18-29-year-olds with a high school degree or less to 13.4% (7.0-24.0) among college graduates in this age group. Similarly, 41.6% (30.4-53.8) of 18-29-year-olds living in households with incomes of less than $20,000 had no health insurance while only 7.9% (3.1-18.5) of those in the highest income group (≥ $75,000) had no health insurance.

Adults without health insurance are more likely than those with insurance to have more health risk factors, such as current smoking status and lack of physical activity.[14] Among those aged 18-64 years who did not have insurance in the 2006 Michigan BRFS, the proportion who were current smokers was 38.4% (33.0-44.0), whereas among insured adults in the same age range, an estimated 23.3% (21.7-25.0) were current smokers.

No Health Care Coverage Among Adults Aged 18-64 Years [a]

Demographic Characteristics	%	95% Confidence Interval
Total	14.6	(13.1 - 16.1)
Age		
18 - 24	29.7	(24.0 - 36.2)
25 - 34	17.8	(14.4 - 21.9)
35 - 44	11.5	(9.3 - 14.1)
45 - 54	10.2	(8.3 - 12.5)
55 - 64	7.9	(6.3 - 9.8)
Gender		
Male	16.4	(14.2 - 19.0)
Female	12.7	(11.1 - 14.5)
Race/Ethnicity		
White non-Hispanic	13.1	(11.6 - 14.7)
Black non-Hispanic	20.8	(15.8 - 26.7)
Other non-Hispanic	14.9	(9.5 - 22.5)
Hispanic	21.3	(12.8 - 33.4)
Education		
< High school	31.8	(24.2 - 40.6)
High school grad	19.3	(16.4 - 22.5)
Some college	14.8	(12.4 - 17.4)
College grad	5.9	(4.4 - 7.8)
Household Income		
< $20,000	33.9	(28.6 - 39.6)
$20,000 - $34,999	28.8	(24.1 - 33.8)
$35,000 - $49,999	13.0	(9.9 - 17.0)
$50,000 - $74,999	5.4	(3.6 - 8.0)
≥ $75,000	1.6	(0.9 - 3.0)

[a] Among those aged 18-64, the proportion who reported having no health care coverage, including health insurance, prepaid plans such as HMOs, or government plans, such as Medicare.

No Health Care Coverage Among Adults Aged 18 Years and Older U.S. vs. Michigan, 1997-2006

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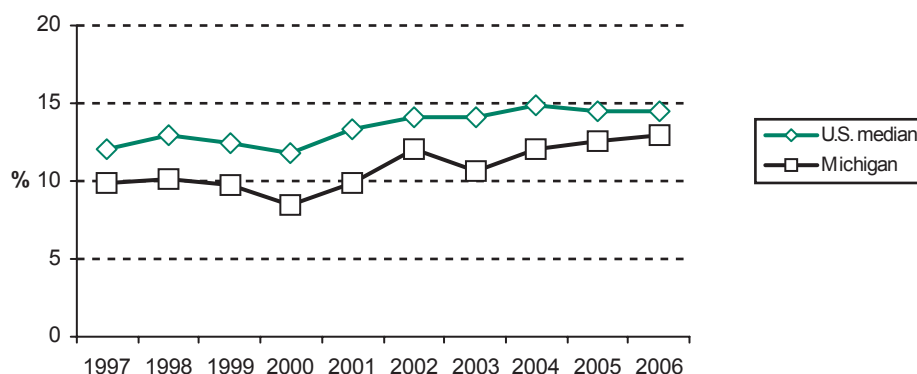
Limited Health Care Coverage

Two additional indicators that address issues related to health care access are also available, i.e., not having a personal doctor or health care provider, and having had a time during the past 12 months when they needed to see a doctor but could not because of the cost.

An estimated 14.1% of Michigan adults did not have a personal doctor or health care provider in 2006. The proportion of Michigan adults who needed to see a doctor in the past year but could not due to the cost was estimated to be 12.0%.

Men were more likely than women to have no personal health care provider (19.5% vs. 9.1%), but equally likely to have no health care access during the past 12 months due to cost (12.0% vs. 12.1%). The proportion for both indicators decreased with increasing education and income levels. When analyzed by race-ethnicity, the proportion of whites without a personal health care provider was lower than for blacks (12.1% vs 22.3%).

Demographic Characteristics	No Personal Health Care Provider [a]		No Health Care Access Due to Cost [b]	
	%	95% Confidence Interval	%	95% Confidence Interval
Total	14.1	(12.8 - 15.4)	12.0	(10.9 - 13.2)
Age				
18 - 24	29.8	(24.2 - 36.1)	19.8	(15.1 - 25.5)
25 - 34	22.4	(18.6 - 26.7)	17.1	(13.9 - 21.0)
35 - 44	13.2	(10.9 - 16.0)	12.4	(10.2 - 15.1)
45 - 54	11.3	(9.2 - 13.7)	11.1	(9.3 - 13.3)
55 - 64	6.8	(5.4 - 8.6)	10.1	(8.2 - 12.4)
65 - 74	4.4	(3.0 - 6.3)	3.9	(2.7 - 5.6)
75 +	4.8	(3.3 - 7.0)	3.3	(2.1 - 5.1)
Gender				
Male	19.5	(17.3 - 21.8)	12.0	(10.2 - 14.0)
Female	9.1	(7.9 - 10.5)	12.1	(10.8 - 13.5)
Race/Ethnicity				
White non-Hispanic	12.1	(10.9 - 13.5)	11.2	(10.0 - 12.4)
Black non-Hispanic	22.3	(17.7 - 27.7)	13.9	(10.2 - 18.6)
Other non-Hispanic	20.1	(13.6 - 28.7)	17.4	(11.7 - 25.1)
Hispanic	20.8	(12.7 - 32.0)	18.2	(11.2 - 28.0)
Education				
< High school	18.9	(13.9 - 25.2)	18.4	(13.8 - 24.2)
High school grad	17.3	(14.9 - 20.0)	12.4	(10.6 - 14.6)
Some college	12.7	(10.8 - 15.0)	14.9	(12.7 - 17.3)
College grad	10.4	(8.6 - 12.5)	7.0	(5.5 - 8.9)
Household Income				
< $20,000	21.0	(17.2 - 25.3)	26.6	(22.6 - 31.1)
$20,000 - $34,999	17.5	(14.2 - 21.3)	19.5	(16.3 - 23.2)
$35,000 - $49,999	14.3	(11.1 - 18.2)	9.4	(7.1 - 12.4)
$50,000 - $74,999	9.6	(7.4 - 12.2)	6.9	(5.2 - 9.2)
≥ $75,000	9.0	(7.1 - 11.2)	3.7	(2.6 - 5.3)

[a] The proportion who reported that they did not have anyone that they thought of as their personal doctor or health care provider.
[b] The proportion who reported that in the past 12 months, they could not see a doctor when they needed to due to the cost.

Health Care Access Indicators by Gender
Michigan, 2006
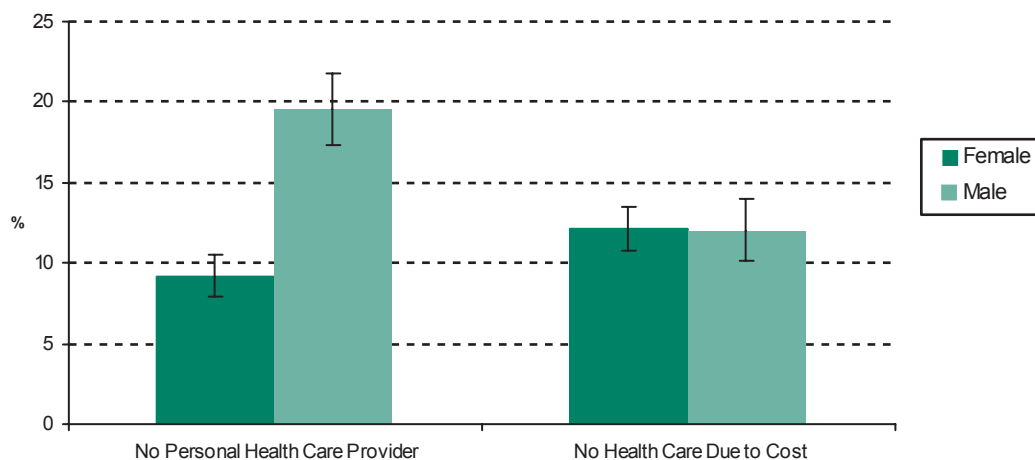
No Leisure-Time Physical Activity

Regular physical activity has been shown to reduce the risk of premature mortality and a number of chronic diseases, such as colon cancer, hypertension, cardiovascular disease, and diabetes. Keeping physically active not only helps maintain a healthy body weight and normal muscle strength, bone mass, and joint function, but it also can relieve symptoms of depression.[15]

In 2006, an estimated 22.8% of Michigan adults did not participate in any leisure-time physical activity (physical activities or exercises such as running, calisthenics, golf, gardening, or walking for exercise in the past month). This proportion was higher among older adults than among younger adults. Women were more likely than men (25.1% vs. 20.3%), and blacks were more likely than other race-ethnic groups to not participate in leisure-time physical activity. Inactivity during leisure time decreased with higher education and income levels.

Despite their disability nearly two-thirds [64.7% (61.9-67.4)] of adults who were disabled (e.g., limited in any activities because of physical, mental, or emotional problems or reported that they required use of special equipment due to health problems) reported that they had engaged in leisure-time physical activity during the past 30 days. While among those without a disability, 81.1% (79.6-82.6) did participate in leisure-time physical activity and 18.9% (17.4-20.4) did not.

Since 1998, the median prevalence of no leisure-time physical activity for the United States has decreased from 27.7% to 22.8% in 2006, whereas in Michigan, the prevalence has stayed relatively consistent.

Demographic Characteristics	No Leisure-Time Physical Activity [a]	
	%	95% Confidence Interval
Total	**22.8**	**(21.6 - 24.2)**
Age		
18 - 24	15.4	(11.2 - 20.9)
25 - 34	19.1	(15.8 - 22.8)
35 - 44	18.8	(16.2 - 21.7)
45 - 54	23.8	(21.1 - 26.6)
55 - 64	27.3	(24.5 - 30.2)
65 - 74	29.5	(25.8 - 33.5)
75 +	34.7	(30.9 - 38.7)
Gender		
Male	20.3	(18.4 - 22.5)
Female	25.1	(23.5 - 26.8)
Race/Ethnicity		
White non-Hispanic	22.3	(21.0 - 23.7)
Black non-Hispanic	30.0	(25.3 - 35.2)
Other non-Hispanic	17.6	(12.4 - 24.5)
Hispanic	14.8	(8.4 - 24.7)
Education		
< High school	34.5	(29.0 - 40.4)
High school grad	32.5	(29.9 - 35.2)
Some college	19.1	(17.0 - 21.4)
College grad	13.0	(11.3 - 14.9)
Household Income		
< $20,000	36.5	(32.4 - 40.8)
$20,000 - $34,999	29.6	(26.2 - 33.1)
$35,000 - $49,999	23.5	(20.2 - 27.1)
$50,000 - $74,999	17.8	(15.1 - 20.8)
≥ $75,000	12.0	(10.1 - 14.1)

[a] The proportion who reported not participating in any leisure-time physical activities or exercises such as running, calisthenics, golf, gardening, or walking during the past month.

No Leisure-Time Physical Activity
U.S. vs. Michigan, 1998-2006
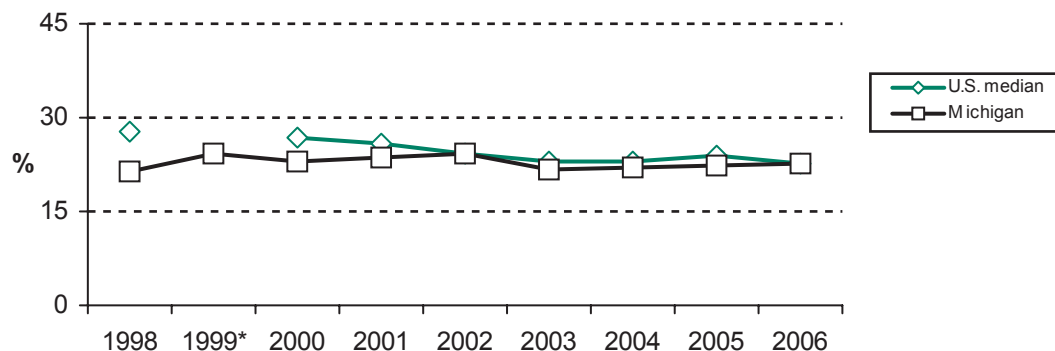
*1999 U.S. data not available

Cigarette Smoking

Smoking contributes to the development of many kinds of chronic conditions, including cancers, respiratory diseases, and cardiovascular diseases, and "remains the leading preventable cause of premature death in the United States."[16] It has been estimated that smoking costs the United States $167 billion in annual health-related economic losses and over 5.5 million years of potential life lost each year.[17]

Current smoking status was defined as ever having smoked 100 cigarettes (five packs) in their life and smoking cigarettes now, either every day or on some days, whereas former smoking status was defined as having smoked at least 100 cigarettes but not currently smoking.

In 2006, an estimated 22.1% of Michigan adults were current smokers, and 25.8% (24.5-27.1) were estimated to be former smokers. Men were more likely than women to be current smokers (24.2% vs. 20.1%), and former smokers (30.1% [27.9-32.4] vs. 21.8% [20.4-23.4]), while women were more likely to have never smoked (58.1% [56.1-60.0] vs. 45.7% [43.1-48.3]). Blacks were more likely than whites to be current smokers, and the prevalence of current smoking declined with increasing levels of education and income.

The proportion of Michigan adults who were current smokers has remained above the U.S. median during the past ten years. To achieve the Healthy People goal of a cigarette smoking prevalence of 12% by 2010,[16] the proportion of current smokers in Michigan will need to drop by 2.5 percentage points each year.

An estimated 62.2% (58.7-65.7) of current smokers in Michigan tried to quit smoking for one day or longer in the past year, and 85.2% (82.0-87.9) of current smokers had ever been advised by a doctor or other health care professional to quit smoking.

The health risk from smoking affects not only smokers but also those around them. Environmental smoke (second-hand smoke) has been linked to lung cancer deaths and heart disease in non-smoking adults and respiratory illnesses, such as asthma and bronchitis, in children.[16] Among current smokers, 46.3% (42.7-50.0) had at least one child living in their household. It is unknown if these households require current smokers to smoke outdoors.

Demographic Characteristics	Current Smoking [a]	
	%	95% Confidence Interval
Total	22.1	(20.7 - 23.5)
Age		
18 - 24	23.6	(18.6 - 29.3)
25 - 34	30.1	(25.9 - 34.6)
35 - 44	25.7	(22.7 - 29.1)
45 - 54	26.3	(23.6 - 29.3)
55 - 64	19.8	(17.3 - 22.5)
65 - 74	9.0	(7.0 - 11.5)
75 +	3.0	(2.0 - 4.5)
Gender		
Male	24.2	(22.0 - 26.6)
Female	20.1	(18.5 - 21.8)
Race/Ethnicity		
White non-Hispanic	20.8	(19.4 - 22.3)
Black non-Hispanic	30.6	(25.7 - 36.1)
Other non-Hispanic	21.2	(14.8 - 29.4)
Hispanic	21.8	(14.1 - 32.1)
Education		
< High school	38.8	(32.6 - 45.3)
High school grad	29.1	(26.4 - 31.9)
Some college	21.8	(19.5 - 24.3)
College grad	10.1	(8.5 - 12.0)
Household Income		
< $20,000	35.2	(30.9 - 39.7)
$20,000 - $34,999	30.2	(26.5 - 34.1)
$35,000 - $49,999	25.5	(21.8 - 29.5)
$50,000 - $74,999	17.7	(14.9 - 20.9)
≥ $75,000	13.5	(11.4 - 15.9)

[a] The proportion who reported that they had ever smoked at least 100 cigarettes (5 packs) in their life and that they smoke cigarettes now, either every day or on some days.

Current Cigarette Smoking
U.S. vs. Michigan, 1997-2006
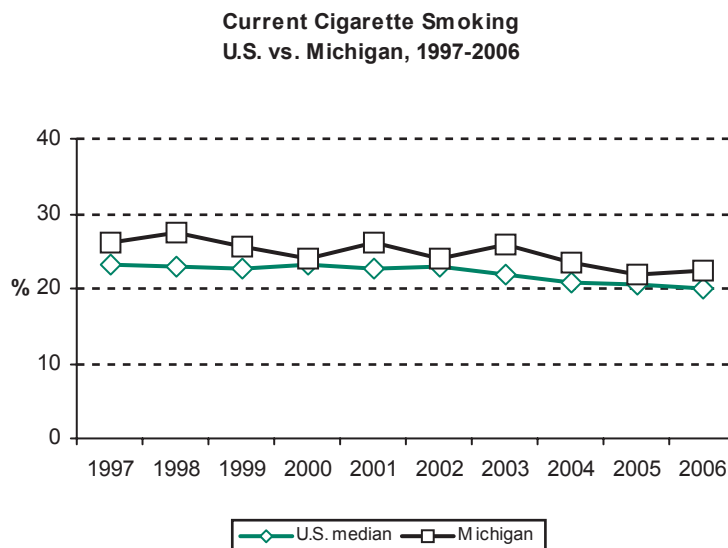
Alcohol Consumption

Alcohol abuse has been associated with serious health problems, such as cirrhosis of the liver, high blood pressure, stroke, and some types of cancer, and can increase the risk for motor vehicle accidents, injuries, violence, and suicide.[18] In Michigan, the percent of fatal motor vehicle crashes that involved any alcohol was 36.0% in 2005.[19]

In 2006, an estimated 17.5% of Michigan adults was estimated to have engaged in binge drinking, i.e., the consumption of five or more drinks per occasion (for men) or 4 or more drinks per occasion (for women) at least once in the previous month. The proportion for binge drinking decreased with age from 28.9% of those aged 18-24 years to 2.3% of those aged 75 years and older. Men were more likely than women (24.5% vs. 11.1%), and whites were more likely than blacks to have engaged in binge drinking.

When compared to the United States median, Michigan has consistently had a higher prevalence of binge drinking. To achieve the Healthy People goal of a binge drinking prevalence of 6% by 2010,[4] the proportion in Michigan will need to drop nearly three percentage points each year.

The proportion who engaged in heavy drinking, i.e., the consumption of more than two alcoholic beverages per day for men or more than one alcoholic beverage per day for women was 4.9% (4.2-5.7).

Approximately one-fifth of Michigan underage adults, aged 18-20 years, reported binge drinking in the previous month (18.5% [12.3-26.8]). An estimated 5.7% (2.7-11.8) of underage adults reported heavy drinking in 2006.

Demographic Characteristics	Binge Drinking [a]	
	%	95% Confidence Interval
Total	17.5	(16.2 - 18.9)
Age		
18 - 24	28.9	(23.2 - 35.3)
25 - 34	27.9	(23.9 - 32.3)
35 - 44	21.8	(19.0 - 25.0)
45 - 54	14.7	(12.6 - 17.1)
55 - 64	9.7	(7.9 - 11.8)
65 - 74	5.5	(4.0 - 7.6)
75 +	2.3	(1.3 - 4.0)
Gender		
Male	24.5	(22.2 - 26.9)
Female	11.1	(9.8 - 12.6)
Race/Ethnicity		
White non-Hispanic	18.1	(16.7 - 19.7)
Black non-Hispanic	12.3	(8.8 - 17.0)
Other non-Hispanic	18.0	(11.9 - 26.3)
Hispanic	22.8	(14.4 - 34.0)
Education		
< High school	17.6	(12.8 - 23.8)
High school grad	17.9	(15.5 - 20.5)
Some college	19.3	(16.9 - 21.9)
College grad	15.2	(13.2 - 17.5)
Household Income		
< $20,000	15.0	(11.7 - 19.2)
$20,000 - $34,999	13.5	(10.7 - 17.0)
$35,000 - $49,999	18.8	(15.5 - 22.7)
$50,000 - $74,999	19.2	(16.3 - 22.5)
≥ $75,000	21.0	(18.4 - 24.0)

[a] The proportion who reported consuming five or more drinks per occasion (for men) or four or more drinks per occasion (for women) at least once in the previous month.

Binge Drinking
U.S. vs. Michigan, 1995-2006
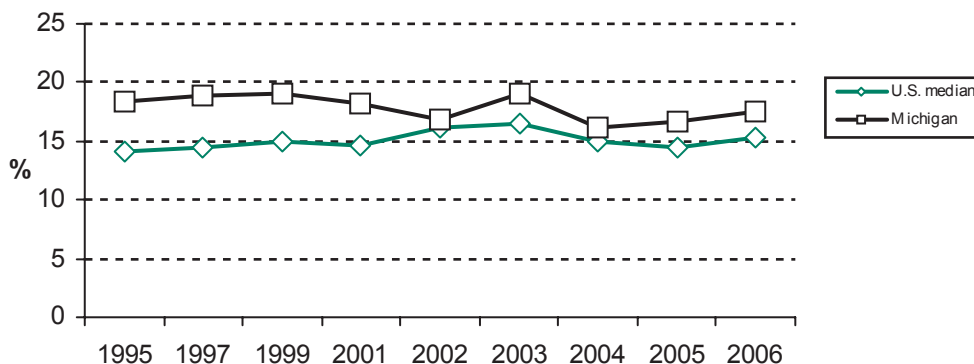
Motor Vehicle Safety

An estimated 43,200 died on the nation's highways in 2005 with an additional 2.68 million injured.[20] Seatbelt use has been proven to save lives and prevent injuries. Fifty-five percent of these passenger vehicle occupants who died were unrestrained.[20] It has been estimated that seatbelt use saves $50 billion in medical care, productivity, and other injury-related costs.[21]

In addition to seatbelt use, driving after drinking is another risk indicator for motor vehicle safety. In Michigan, 3.9% of all crashes were reported to involve drinking in 2005. During this same time period, three out of every ten fatal motor vehicle crashes involved drinking. Consumption of alcohol is a major factor in the more serious types of motor vehicle crashes.[22]

In 2006, an estimated 87.8% of Michigan adults always used a seatbelt. This prevalence was higher for women than men (91.9% vs. 83.4%) and increased with increasing levels of education.

The proportion of Michigan adults who reported that they had driven when they had had too much to drink at least once in the previous month was 3.1% in 2006. Men were over four times as likely to drive after drinking compared with women (5.1% vs. 1.2%) and whites were more likely than blacks to drive after drinking (3.4% vs. 1.0%).

| Demographic Characteristics	Always Uses a Seatbelt[a]		Drove Motor Vehicle After Drinking[b]	
	%	95% Confidence Interval	%	95% Confidence Interval
Total	87.8	(86.5 - 88.9)	3.1	(2.5 - 3.7)
Age				
18 - 24	80.2	(74.3 - 84.9)	5.3	(3.0 - 9.1)
25 - 34	83.4	(79.4 - 86.8)	2.9	(1.8 - 4.8)
35 - 44	87.6	(85.0 - 89.8)	5.1	(3.7 - 7.0)
45 - 54	90.5	(88.3 - 92.3)	2.8	(1.9 - 4.1)
55 - 64	91.6	(89.6 - 93.2)	2.1	(1.4 - 3.1)
65 - 74	88.5	(85.1 - 91.2)	0.3	(0.1 - 1.7)
75 +	94.1	(91.9 - 95.7)	0.4	(0.1 - 1.4)
Gender				
Male	83.4	(81.2 - 85.3)	5.1	(4.0 - 6.3)
Female	91.9	(90.5 - 93.0)	1.2	(0.8 - 1.8)
Race/Ethnicity				
White non-Hispanic	87.9	(86.6 - 89.2)	3.4	(2.8 - 4.2)
Black non-Hispanic	87.2	(82.7 - 90.6)	1.0	(0.4 - 2.2)
Other non-Hispanic	89.3	(82.2 - 93.8)	3.4	(1.1 - 10.0)
Hispanic	84.2	(73.3 - 91.2)	2.4	(0.3 - 14.9)
Education				
< High school	84.0	(77.8 - 88.7)	2.0	(0.6 - 6.1)
High school grad	87.2	(84.9 - 89.2)	2.7	(1.8 - 3.9)
Some college	86.1	(83.7 - 88.2)	3.7	(2.6 - 5.1)
College grad	91.2	(89.3 - 92.7)	3.2	(2.3 - 4.5)
Household Income				
< $20,000	83.8	(79.6 - 87.2)	3.5	(1.9 - 6.2)
$20,000 - $34,999	87.5	(84.2 - 90.2)	2.3	(1.2 - 4.4)
$35,000 - $49,999	88.8	(85.6 - 91.4)	3.4	(2.3 - 5.1)
$50,000 - $74,999	89.1	(86.4 - 91.3)	3.1	(2.1 - 4.7)
≥ $75,000	88.0	(85.5 - 90.1)	4.4	(3.2 - 6.1)

[a] The proportion who reported always using a seatbelt when driving or riding in a car.
[b] Proportion who reported that they had driven when they'd had too much to drink at least once in the previous month.

Seatbelt Use By Gender
Michigan, 2006
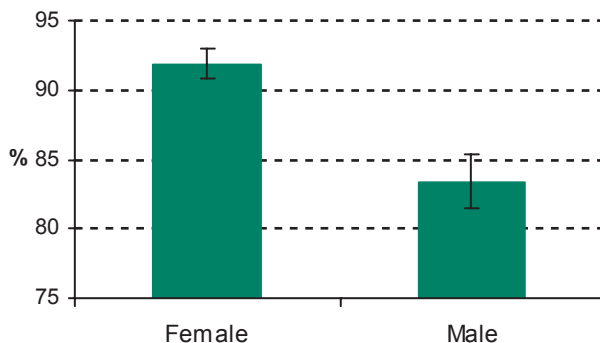
Drove Motor Vehicle After Drinking By Gender
Michigan, 2006
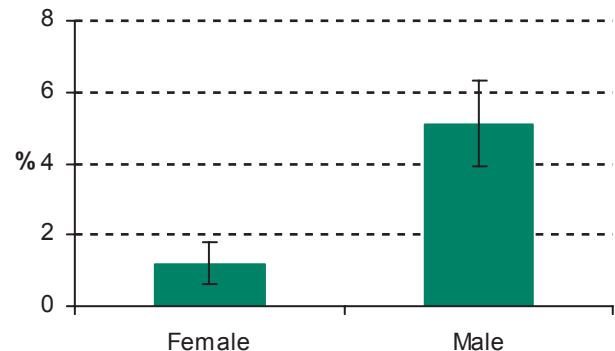
No Routine Checkup

A yearly routine checkup with a health care professional provides an opportunity to raise awareness regarding adult preventative services, conduct individual risk assessments, promote informed decision-making, and potentially benefit from early detection.[23-24]

In 2006, an estimated 31.3% of Michigan adults had not had a routine checkup in the past year. This proportion was highest among those aged 25-34 years old (47.0%), and then decreased to 11.1% of those aged 75 and older. Men were more likely to have not had routine checkup in past year when compared with women (37.2% vs. 26.0%), as were whites compared with blacks (32.9% vs 21.5%).

During the routine checkup the health care professional can suggest appropriate screenings and immunizations. The figure shows the proportion who received appropriate clinical preventative services among those who had a routine checkup in the past year. The yearly checkup is also an opportunity for health care professionals to provide risk reduction advise. Among current smokers with a routine checkup, 88.0% (84.0-91.1) received advice to quit smoking. Likewise, among those at risk for diabetes (i.e., obese, inactive adults aged ≥ 40) who did have a routine checkup in the past year, 60.6% (52.8-67.9) were checked for diabetes within the past year.

Among those who had not had a routine checkup in the past year, the majority (74.3%) did currently have health care coverage.

Demographic Characteristics	Had No Routine Checkup in Past Year[a]	
	%	95% Confidence Interval
Total	**31.3**	**(29.8 - 32.9)**
Age		
18 - 24	37.5	(31.4 - 44.2)
25 - 34	47.0	(42.4 - 51.6)
35 - 44	37.3	(33.9 - 40.8)
45 - 54	30.4	(27.5 - 33.5)
55 - 64	22.0	(19.5 - 24.8)
65 - 74	15.7	(13.0 - 18.7)
75 +	11.1	(8.8 - 13.8)
Gender		
Male	37.2	(34.6 - 39.8)
Female	26.0	(24.2 - 27.8)
Race/Ethnicity		
White non-Hispanic	32.9	(31.3 - 34.6)
Black non-Hispanic	21.5	(17.0 - 26.8)
Other non-Hispanic	34.0	(26.3 - 42.6)
Hispanic	28.8	(19.8 - 39.9)
Education		
< High school	26.9	(21.5 - 33.1)
High school grad	31.4	(28.7 - 34.3)
Some college	33.5	(30.6 - 36.4)
College grad	30.3	(27.7 - 33.1)
Household Income		
< $20,000	34.3	(30.0 - 38.8)
$20,000 - $34,999	34.0	(30.2 - 38.0)
$35,000 - $49,999	37.4	(33.2 - 41.8)
$50,000 - $74,999	30.5	(27.0 - 34.2)
≥ $75,000	26.5	(23.7 - 29.6)

[a] The proportion who reported that they did not have a routine checkup in the past year.

Cancer Screenings and Immunization
Among Those With a Routine Checkup in Past Year
Michigan, 2006
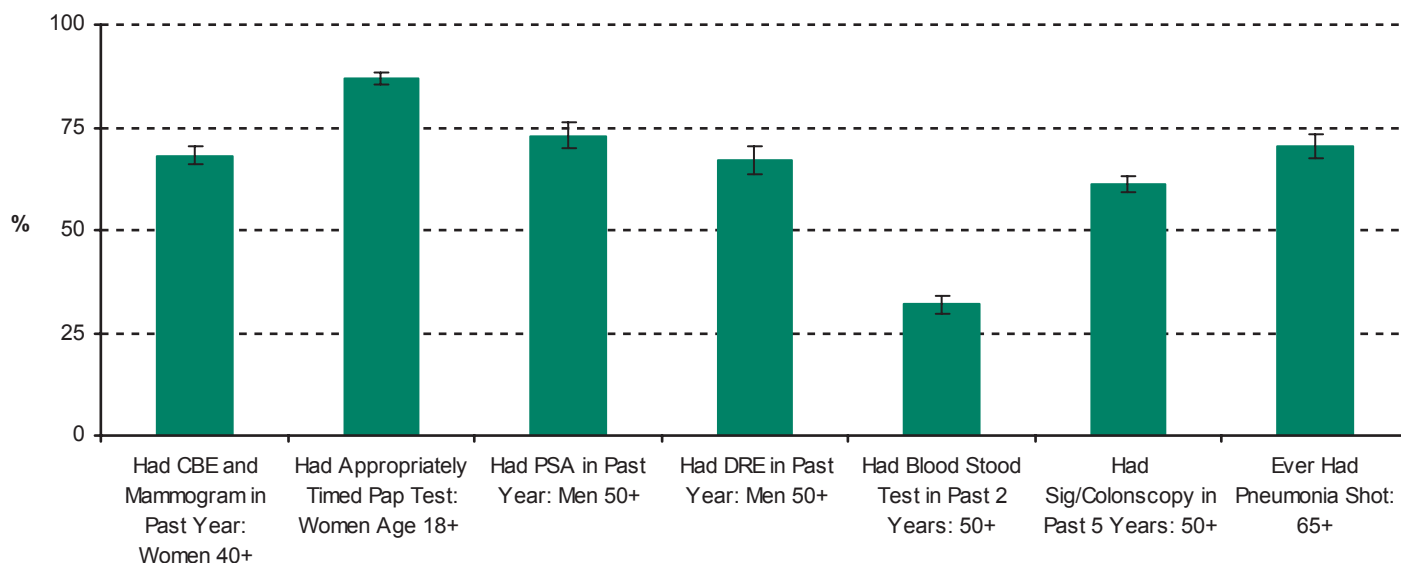
Breast Cancer Screening

Breast cancer is the second leading cause of cancer deaths among United States women.[25-26] In 2003, there were 1,425 deaths among Michigan women due to breast cancer, second only to that of lung cancer.[27] Early detection of breast cancer can occur through the use of screening tools such as mammography and clinical breast exams. Current recommendations from the American Cancer Society include that women aged 20-39 years should have a clinical or physical breast exam by a health professional every three years, and women aged 40 years and older should have both a clinical breast exam (CBE) and mammogram annually.[25-26, 28]

In 2006, an estimated 57.2% of Michigan women aged 40 years and older had both a clinical breast exam and mammogram in the past year. This proportion increased with age from 51.5% of those aged 40-49 years to 66.2% of those aged 60-69 years, then decreased to 50.1% for those aged 70 and older. This prevalence estimate increased with education and income levels.

Three-quarters (75.4% [73.7-77.0]) of Michigan women had an appropriately timed CBE, i.e., within the past 3 years for women aged 18-39 years and within the past year for those 40 and older. This proportion increased with education level from 61.5% (53.8-68.6) of those who did not have a high school diploma to 83.5% (80.9-85.8) of college graduates.

An estimated 64.3% (62.2-66.3) of women aged 40 years and older had a mammogram in the past year. This proportion increased with age from 54.9% (50.8-59.0) of those aged 40-49 years to 72.4% (68.4-76.1) of those aged 60-69 years and then declined to 64.7% (60.7-68.6) of those aged 70 years and older. This proportion also increased with education and income levels.

The figure uses the *Healthy People 2010* indicator concerning the proportion of women aged 40 years and older who have received a mammogram within the preceding two years.[29] The proportion of Michigan women aged 40 years and older who have received a mammogram in the past two years has remained slightly above the U.S. median for the past ten years.

Had Clinical Breast Exam and Mammogram in Past Year Among Women Aged 40 and Older [a]

Demographic Characteristics	%	95% Confidence Interval
Total	57.2	(55.1 - 59.3)
Age		
40 - 49	51.5	(47.4 - 55.7)
50 - 59	63.2	(59.3 - 66.9)
60 - 69	66.2	(62.0 - 70.1)
70 +	50.1	(45.9 - 54.3)
Race/Ethnicity		
White non-Hispanic	57.6	(55.4 - 59.8)
Black non-Hispanic	54.8	(47.3 - 62.1)
Other non-Hispanic	50.5	(39.3 - 61.6)
Hispanic	—[b]	
Education		
< High school	44.7	(37.2 - 52.4)
High school grad	55.2	(51.7 - 58.6)
Some college	59.0	(55.0 - 62.9)
College grad	61.6	(57.6 - 65.4)
Household Income		
< $20,000	46.5	(41.3 - 51.8)
$20,000 - $34,999	55.3	(50.4 - 60.0)
$35,000 - $49,999	59.1	(53.4 - 64.5)
$50,000 - $74,999	63.6	(57.9 - 68.9)
≥ $75,000	61.6	(57.0 - 66.1)

Note: Data included diagnostic tests.
[a] Among women aged 40 years and older, the proportion who had both a clinical breast exam and mammogram in the previous year.
[b] The denominator in this subgroup was less than 50.

Had a Mammogram in the Past Two Years Among Women Aged 40 Years and Older U.S. vs. Michigan, 1997-2006
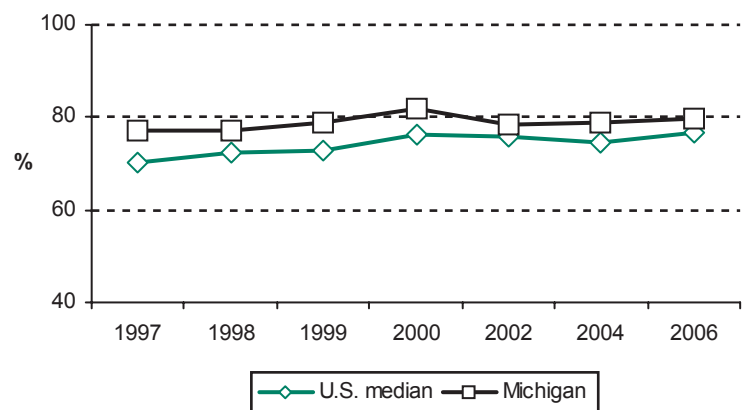
Cervical cancer screening has helped reduce the number of deaths from cervical cancer by 70%.[29] Current guidelines for cervical cancer screening recommend that Pap testing should begin within three years after the onset of sexual intercourse, or at least by 21 years of age. Once three or more annual tests have been normal, at the discretion of the physician, Pap tests can be performed less frequently, but at least once every three years.[30-34]

One *Healthy People 2010* objective is to increase the prevalence of women aged 18 years and older who received a Pap test within the preceding three years to 90%.[29] In 2006, 82.6% of Michigan women aged 18 years and older had a Pap test within the previous three years. This estimate increased with age from 77.7% of those aged 18-29 years of age to 91.1% of those aged 30-39 years and then declined to 64.5% of those aged 70 years and older. This proportion also increased with education level. The proportion of Michigan women aged 18 years and older who have received a Pap test in the past three years has remained consistent with the U.S. median for the past ten years.

Another *Healthy People 2010* objective is to increase the proportion of women aged 18 years and older who have ever received a Pap test to 97%.[29] In 2006, an estimated 94.8% (93.5-95.9) of Michigan women aged 18 years and older reported ever having a Pap test. This proportion increased with age from 81.2% (75.2-86.0) of those aged 18-29 years to 99.5% (98.7-99.8) of those aged 40-49 years and then declined to 92.5% (90.1-94.4) of those aged 70 years and older.

Demographic Characteristics	Had Appropriately Timed Pap Test [a]	
	%	95% Confidence Interval
Total	82.6	(81.0 - 84.1)
Age		
18 - 29	77.7	(71.6 - 82.8)
30 - 39	91.1	(87.6 - 93.6)
40 - 49	89.4	(86.6 - 91.7)
50 - 59	85.1	(82.1 - 87.7)
60 - 69	82.4	(78.6 - 85.6)
70 +	64.5	(60.3 - 68.4)
Race/Ethnicity		
White non-Hispanic	81.7	(79.8 - 83.4)
Black non-Hispanic	87.7	(82.8 - 91.4)
Other non-Hispanic	82.2	(73.2 - 88.7)
Hispanic	84.9	(72.6 - 92.2)
Education		
< High school	71.4	(64.0 - 77.9)
High school grad	78.4	(75.3 - 81.1)
Some college	81.4	(78.0 - 84.3)
College grad	92.1	(90.1 - 93.8)
Household Income		
< $20,000	73.5	(68.7 - 77.8)
$20,000 - $34,999	78.2	(74.2 - 81.8)
$35,000 - $49,999	84.8	(80.5 - 88.4)
$50,000 - $74,999	92.1	(89.2 - 94.3)
≥ $75,000	90.6	(87.5 - 93.0)

Note: Data included diagnostic tests.

[a] Among women aged 18 years and older, the proportion who had a Pap test within the previous three years.

**Had a Pap Test in the Past Three Years
Among Women Aged 18 Years and Older
U.S. vs. Michigan, 1997-2006**
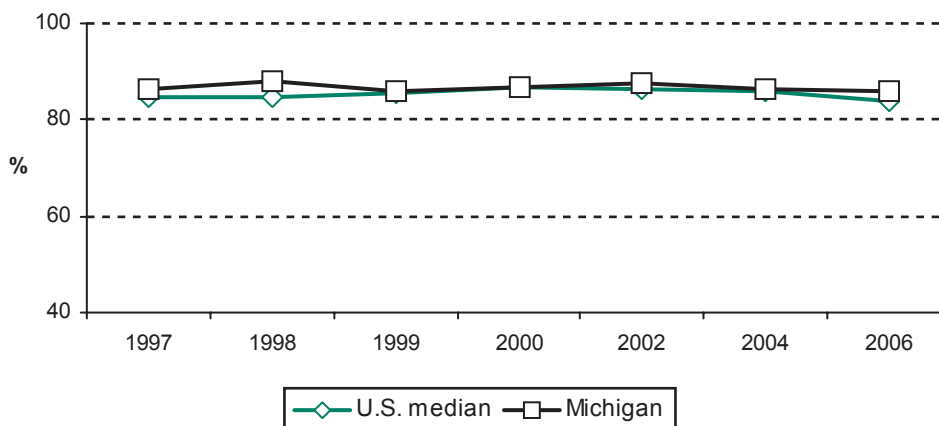
Prostate Cancer Screening

Prostate cancer is the second leading cause of cancer deaths among males in Michigan; there were 985 deaths in 2003 (25.5 deaths per 100,000 male population, age adjusted).[35] The American Cancer Society recommends that health care professionals should offer the digital rectal exam (DRE) and prostate-specific antigen (PSA) blood test screenings to men aged 50 and older who have at least a ten-year life expectancy.[36] Men who have an increased risk for prostate cancer should begin testing earlier.[37] Some of the risk factors that are associated with prostate cancer, other than age, include race, nationality, family history, and diet.[38] Screening can detect the disease in its early stages, but it is still undetermined whether screening improves health outcomes.[38-39]

In 2006, it was estimated that 54.9% of Michigan men aged 50 years and older had a DRE in the past year, and 60.4% had a PSA test in the past year. A higher proportion of men aged 60-69 years had a DRE in the past year compared with men aged 50-59 years (63.5% vs. 48.8%). A higher proportion of men aged 60-69 also had a PSA test in the past year (69.7%) compared with younger men. The proportion of men 50 and older who had a DRE in the past year increased with income levels from 34.9% of those with incomes under $20,000 to 63.1% of those with incomes between $50,000 and $74,000. Likewise, the proportion of men over 50 who had a PSA in the past year increased with income levels from 33.3% of those with incomes under $20,000 to 68.6% of those with incomes $75,000 and over.

It was estimated that 6.2% (4.8-7.9) of men aged 50 years and older in Michigan had ever been diagnosed with prostate cancer.

| Demographic Characteristics	Had DRE in Past Year[a]		Had PSA in Past Year[b]	
	%	95% Confidence Interval	%	95% Confidence Interval
Total	54.9	(51.6 - 58.1)	60.4	(57.1 - 63.6)
Age				
50 - 59	48.8	(43.8 - 53.9)	53.3	(48.1 - 58.4)
60 - 69	63.5	(57.9 - 68.8)	69.7	(64.0 - 75.0)
70 +	56.7	(50.5 - 62.8)	63.6	(57.3 - 69.5)
Race/Ethnicity				
White non-Hispanic	54.9	(51.5 - 58.2)	61.1	(57.7 - 64.4)
Black non-Hispanic	50.3	(37.1 - 63.4)	63.6	(49.9 - 75.3)
Other non-Hispanic	—[c]		—[c]	
Hispanic	—[c]		—[c]	
Education				
< High school	52.5	(40.9 - 63.9)	55.8	(43.6 - 67.3)
High school grad	54.1	(48.2 - 60.0)	52.8	(46.6 - 58.9)
Some college	50.1	(44.2 - 56.1)	58.6	(52.5 - 64.5)
College grad	61.6	(55.9 - 67.0)	71.3	(65.7 - 76.3)
Household Income				
< $20,000	34.9	(26.7 - 44.1)	33.3	(25.1 - 42.6)
$20,000 - $34,999	51.1	(44.1 - 58.0)	56.8	(49.4 - 63.8)
$35,000 - $49,999	52.1	(44.1 - 60.1)	59.8	(51.2 - 67.8)
$50,000 - $74,999	63.1	(55.1 - 70.4)	66.3	(58.1 - 73.6)
≥ $75,000	60.9	(54.0 - 67.5)	68.6	(61.9 - 74.7)

Among men aged 50 years and older, the proportion who reported…
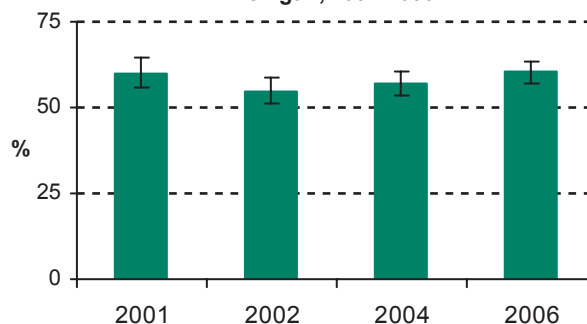[a] having a digital rectal exam in the past year.
[b] having a PSA test in the past year.
[c]The denominator in this subgroup was less than 50.

Had a DRE in the Past Year
Among Men Aged 50 Years and Older
Michigan, 2001-2006
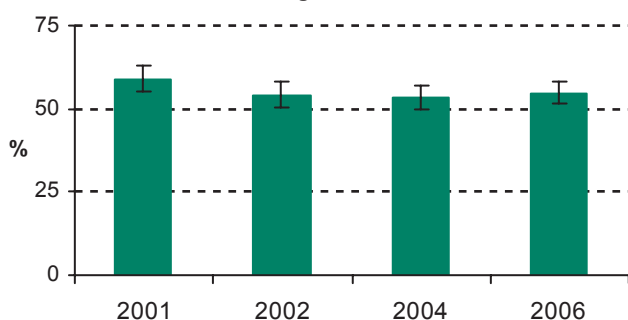
Had a PSA Test in the Past Year
Among Men Aged 50 Years and Older
Michigan, 2001-2006

Colorectal Cancer Screening

In 2003, colorectal cancer was the third leading cause of cancer-related deaths in Michigan and the second leading cause in the United States with 1,916[40] and 55,616[41] deaths, respectively. Fecal occult blood tests, sigmoidoscopy, and colonoscopy are screening procedures that are performed to detect colorectal cancer in the early stages. In the United States Preventive Services Task Force review of research literature, they have found evidence that periodic fecal occult blood testing and sigmoidoscopy reduces mortality from colorectal cancer; colonoscopy has not been studied adequately yet.[42-43]

One *Healthy People 2010* objective is to increase the proportion of adults aged 50 years and older who have received a fecal occult blood test within the preceding two years to 33%.[4] An estimated 27.5% of Michigan adults aged 50 years and older had a blood stool test in the past two years. Over half (55.9%) of all Michigan adults aged 50 years and older had a sigmoidoscopy or colonoscopy in the past five years.

The figure shows the current trends in the use of colorectal cancer screening. The percentage of those having a blood stool test in the past two years has steadily decreased since 2001, while the percentage of those having a sigmoidoscopy or colonoscopy in the past five years has increased since 1999.

Demographic Characteristics	Had Blood Stool Test in Past Two Years[a]		Had Sigmoidoscopy or Colonoscopy in Past 5 Years[b]	
	%	95% Confidence Interval	%	95% Confidence Interval
Total	27.5	(25.7 - 29.3)	55.9	(54.0 - 57.9)
Age				
50 - 59	24.2	(21.5 - 27.0)	49.8	(46.6 - 53.1)
60 - 69	28.7	(25.6 - 32.0)	62.6	(59.2 - 65.9)
70 +	31.1	(28.0 - 34.5)	58.7	(55.2 - 62.1)
Gender				
Male	27.0	(24.2 - 29.9)	57.3	(54.0 - 60.5)
Female	27.9	(25.7 - 30.1)	54.8	(52.4 - 57.2)
Race/Ethnicity				
White non-Hispanic	27.6	(25.8 - 29.5)	55.3	(53.2 - 57.3)
Black non-Hispanic	30.6	(23.8 - 38.3)	61.7	(53.8 - 69.1)
Other non-Hispanic	22.0	(14.3 - 32.2)	56.1	(44.8 - 66.7)
Hispanic	_[c]		_[c]	
Education				
< High school	24.9	(19.6 - 31.1)	48.3	(41.6 - 55.1)
High school grad	25.0	(22.3 - 28.0)	54.8	(51.4 - 58.0)
Some college	27.7	(24.4 - 31.2)	54.7	(50.9 - 58.5)
College grad	31.4	(28.1 - 35.0)	61.4	(57.8 - 65.0)
Household Income				
< $20,000	25.2	(21.1 - 29.7)	48.6	(43.7 - 53.6)
$20,000 - $34,999	26.8	(23.2 - 30.7)	54.7	(50.4 - 58.9)
$35,000 - $49,999	25.9	(21.8 - 30.4)	55.2	(50.0 - 60.3)
$50,000 - $74,999	27.6	(23.1 - 32.5)	60.2	(54.7 - 65.4)
≥ $75,000	31.4	(27.1 - 36.1)	60.9	(56.2 - 65.5)

[a] Among those aged 50 years and older, the proportion who had a blood stool test within the past two years using a home kit.
[b] Among those aged 50 years and older, the proportion who had a sigmoidoscopy or colonoscopy within the past five years.
[c] The denominator in this subgroup was less than 50.

Colorectal Cancer Screening Among Adults Aged 50 Years and Older Michigan, 1999-2006
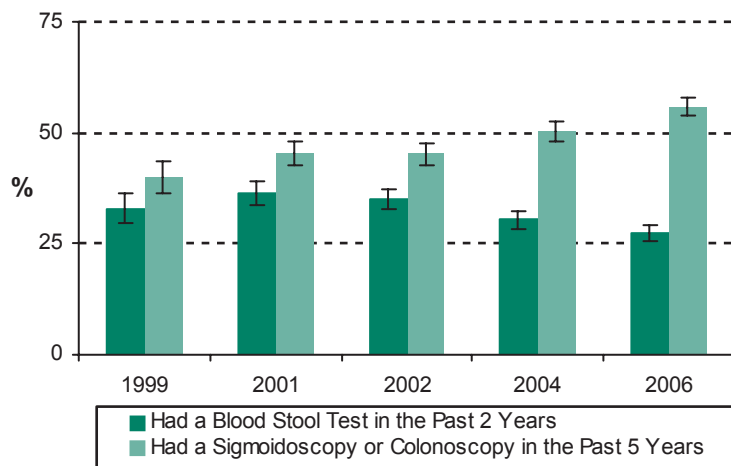
Risk factors associated with colorectal cancer include having a family history, ethnic background, age, diet from animal sources, physical inactivity, diabetes, smoking, and alcohol intake.[44]

Those who were active in their leisure time in 2006 were more likely to have had a sigmoidoscopy or colonoscopy in the previous five years than those who were inactive in their leisure time (57.9% [55.5-60.2] vs. 51.0% [47.3-54.7]).

Current smokers (44.0% [38.9-49.2]) were less likely than those who were former smokers (60.3% [57.1-63.4]) or never smokers (56.4% [53.5-59.2]) to have had a sigmoidoscopy or colonoscopy in the past five years, and were also less likely to have had a blood stool test in the past two years (20.0% [16.3-24.3], 30.0% [27.1-33.1], 27.9% [25.3-30.5] respectively).

Oral Health

Oral health is an important part of one's general health and quality of life. Regular dental care includes preventive dental services such as teeth cleaning, and permits early diagnosis and treatment of tooth decay and periodontal diseases.[45] It has been estimated that low income adults aged 18 years and older are three times more likely to have at least one untreated decayed tooth compared with higher income adults (33% vs. 11%).[46]

An estimated 25.4% of Michigan adults did not visit the dentist in the past year. Men were more likely than women (27.7% vs. 23.4%) to have not seen the dentist in the past year. This proportion declined with education and income levels. The proportion who have been told by a doctor, dentist, or dental hygienist that they currently have gum disease, such as gingivitis or periodontal disease is 8.7% (7.8-9.6).

Tooth loss is the result of disease or injury.[45] In 2006, 57.2% (55.6-58.7) of Michigan adults had not ever had any permanent teeth removed because of tooth decay or gum disease. An estimated 15.8% (14.8-16.9) had six or more missing teeth. The proportion of missing six teeth or more increased with age from 0.8% (0.2-3.8) of those 18-24 to 48.5% (44.3-52.8) of those 75 and older. Blacks had a higher proportion of missing six or more teeth than both whites and Hispanics [black non-Hispanic 21.2% (17.5-25.5), white non-Hispanic 15.0% (14.0-16.1), other non-Hispanic 18.6% (13.5-25.0), and Hispanic 7.7% (3.5-16.1)]. This proportion decreased with education and income.

Periodontal disease is associated with certain chronic conditions, such as diabetes, cardiovascular disease, and stroke.[45] One *Healthy People 2010* objective is to increase the proportion of persons with diabetes who have had at least an annual dentist examination.[4] However, in 2006, those who had diabetes were more likely to have not visited the dentist in the past year compared with those without diabetes (35.8% [31.4-40.5] vs. 24.4% [22.9-25.9]). Among those who had diabetes, 14.6% (11.8-18.0) were estimated to be missing all their teeth compared to 4.1% (3.6-4.6) of those who did not have diabetes.

Tobacco use is one of the greatest preventable risk factors for oral cancer.[45] In 2003, oral cancer accounted for 257 deaths in Michigan and 7,712 deaths in the United States.[16,27] Current smokers were more likely than former smokers and never smokers to have not seen the dentist in the past year (38.4% [34.9-42.1], 26.2% [23.7-28.9], 19.6% [17.8-21.5]). Smokers (6.5% [5.2-.8.0]) and former smokers (8.0% [6.8-9.4]) were more likely than never smokers (2.9% [2.3-3.6]) to have all their teeth missing.

Demographic Characteristics	No Dental Visit in Past Year[a]	
	%	95% Confidence Interval
Total	25.4	(24.0 - 26.9)
Age		
18 - 24	26.0	(20.6 - 32.2)
25 - 34	28.8	(24.7 - 33.2)
35 - 44	25.2	(22.2 - 28.6)
45 - 54	21.5	(19.0 - 24.3)
55 - 64	23.2	(20.5 - 26.2)
65 - 74	27.3	(23.6 - 31.3)
75 +	30.6	(26.9 - 34.7)
Gender		
Male	27.7	(25.4 - 30.1)
Female	23.4	(21.7 - 25.2)
Race/Ethnicity		
White non-Hispanic	23.1	(21.7 - 24.6)
Black non-Hispanic	36.7	(31.6 - 42.2)
Other non-Hispanic	35.0	(27.5 - 43.3)
Hispanic	23.6	(15.6 - 34.1)
Education		
< High school	47.1	(40.9 - 53.5)
High school grad	31.8	(29.1 - 34.5)
Some college	25.7	(23.1 - 28.4)
College grad	12.6	(10.8 - 14.7)
Household Income		
< $20,000	51.5	(46.9 - 56.1)
$20,000 - $34,999	37.9	(34.1 - 41.9)
$35,000 - $49,999	24.9	(21.2 - 28.9)
$50,000 - $74,999	17.2	(14.4 - 20.4)
≥ $75,000	10.1	(8.2 - 12.3)

[a] The proportion who reported that they had not visited a dentist or dental clinic for any reason in the previous year.

Oral Health Risk Factors by Race-Ethnicity Michigan, 2006
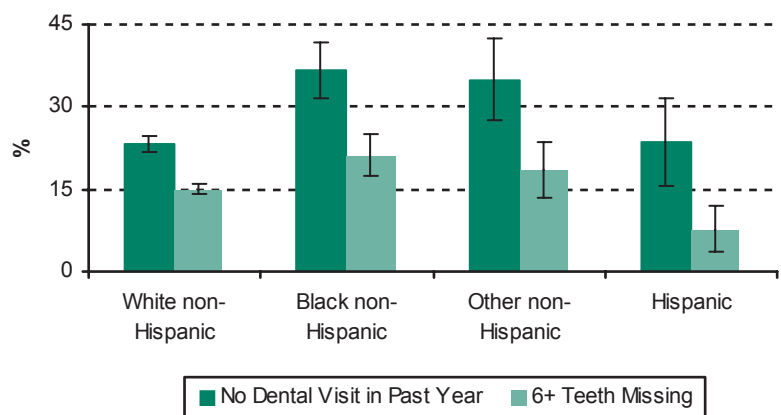
Adult Immunizations

Adult immunizations against influenza and pneumococcal disease are important health indicators that need to be routinely monitored since morbidity and mortality are associated with both of these diseases among different demographic groups.[47-48] Influenza and pneumonia were the 6th leading cause of death in 2003 among adults 65 years and older in the United States, attributing to nearly 57,500 deaths.[49]

A *Healthy People 2010* objective is to ensure that 90% of adults aged 65 years and older are vaccinated annually against influenza and ever vaccinated against pneumococcal disease.[4] Results from the 2006 MI BRFS indicate that 71.8% of Michigan adults aged 65 years and older were immunized against influenza in the past year, 67.7% had ever received a pneumococcal vaccination, and 57.8% (54.9-60.7) had received both. Although the prevalence of current flu vaccination has not changed significantly since 1997, the prevalence of ever receiving the pheumonia vaccine has increased nearly 50% (from 45.8% to 67.7%).

Another objective is to increase the vaccination rate to 60% among those aged 18-64 years who have chronic health conditions such as diabetes and asthma.[4] Morbidity and mortality related to influenza and pneumoccocal disease is higher among those who have diabetes.[48] Among those aged 18-64 years, an estimated 49.6% (43.5-55.7) of those who had diabetes had an influenza vaccination in the past year compared with 23.0% (21.5-24.6) of those who did not have diabetes. An estimated 39.8% (34.0-45.9) of those who had diabetes had a pneumococcal shot compared to 12.7% (11.4-14.1) of those who did not have diabetes. Those who had current asthma in this age group were also more likely to have had an influenza vaccination than those who did not have asthma (37.5% [32.3-43.0] vs. 23.3% [21.8-24.9]).

Demographic Characteristics	Had Flu Vaccine in Past Year[a]		Ever Had Pneumonia Vaccine[b]	
	%	95% Confidence Interval	%	95% Confidence Interval
Total	71.8	(69.1 - 74.3)	67.7	(64.9 - 70.4)
Age				
65 - 74	67.0	(63.2 - 70.7)	58.7	(54.6 - 62.7)
75 +	76.3	(72.6 - 79.7)	76.5	(72.7 - 79.9)
Gender				
Male	74.6	(70.1 - 78.7)	66.6	(61.7 - 71.2)
Female	69.7	(66.4 - 72.7)	68.6	(65.2 - 71.7)
Race/Ethnicity				
White non-Hispanic	73.8	(71.1 - 76.3)	70.0	(67.2 - 72.7)
Black non-Hispanic	53.1	(41.5 - 64.4)	48.5	(37.0 - 60.2)
Other non-Hispanic	_[c]		_[c]	
Hispanic	_[c]		_[c]	
Education				
< High school	66.2	(58.5 - 73.1)	61.0	(53.0 - 68.5)
High school grad	73.7	(69.6 - 77.4)	69.3	(64.9 - 73.3)
Some college	66.8	(61.0 - 72.2)	68.3	(62.5 - 73.7)
College grad	78.0	(72.4 - 82.8)	68.3	(62.1 - 73.9)
Household Income				
< $20,000	63.4	(57.1 - 69.2)	66.1	(59.9 - 71.8)
$20,000 - $34,999	73.4	(68.2 - 78.1)	68.2	(62.6 - 73.4)
$35,000 - $49,999	72.8	(65.5 - 79.1)	69.3	(61.8 - 75.9)
$50,000 - $74,999	76.7	(66.2 - 84.7)	64.1	(53.3 - 73.6)
≥ $75,000	76.2	(66.3 - 83.9)	65.2	(54.5 - 74.6)

[a] Among those aged 65 years and older, the proportion who reported that they had a flu vaccine, either by an injection in the arm or sprayed in the nose during the past 12 months.
[b] Among those aged 65 years and older, the proportion who reported that they ever had a pneumococcal vaccine.
[c] The denominator in this subgroup was less than 50.

Ever Had a Pneumococcal Vaccination Among Adults Aged 65 and Older U.S. vs. Michigan, 1997-2006
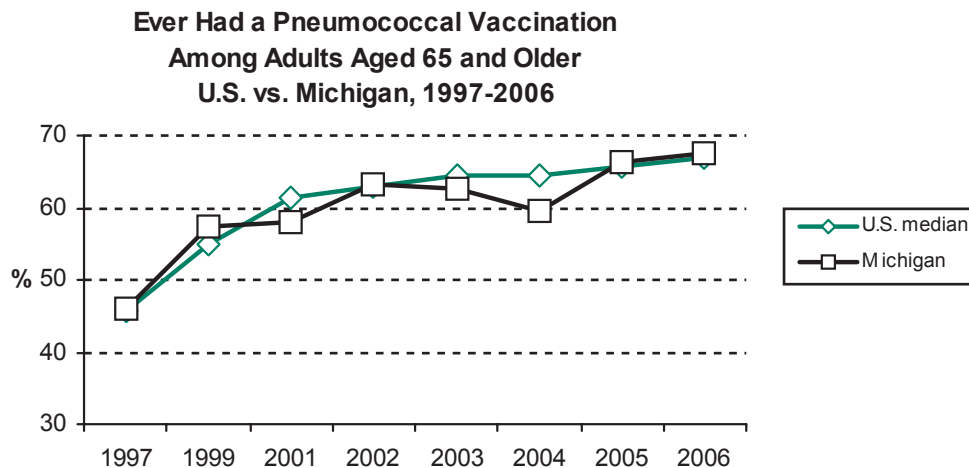
HIV Testing

It is estimated that 16,200 people are living with HIV/AIDS in Michigan, 4,500 of whom do not know that they are infected.[50] Early awareness of an HIV infection through HIV testing can prevent further spread of the disease, and an early start on antiretroviral therapy can increase the quality of life among those who are living with HIV/AIDS.[51-52]

An estimated 35.4% of Michigan adults aged 18-64 years had ever been tested for HIV, apart from blood donations. The prevalence of HIV testing decreased with age from 52.8% among those aged 25-34 years to 17.9% among those aged 55-64 years. Women were more likely than men (38.1% vs. 32.6%) to have ever been tested and blacks were more likely than both whites and Hispanics.

Since 2000, the prevalence of HIV testing in Michigan among adults aged 18-64 years has decreased 27.0% (from 48.5% to 35.4%).

The most frequently reported places where Michigan adults had their last HIV test were at a private doctor or HMO (43.7% [40.7-47.0]), at a clinic (22.8% [20.0-25.1]), and at a hospital (19.6% [17.2-22.3]).

Rapid HIV antibody tests provide results within a couple of hours. Of those tested for HIV in the past 12 months, 15.8% (12.5-19.7) reported a rapid test was used, 76.8% (72.7-80.5) reported a conventional test was used, and 7.4% (5.5-9.8) did not know.

Demographic Characteristics	Ever Had an HIV Test[a]	
	%	95% Confidence Interval
Total	35.4	(33.6 - 37.2)
Age		
18 - 24	28.3	(22.8 - 34.6)
25 - 34	52.8	(48.1 - 57.4)
35 - 44	43.6	(40.1 - 47.1)
45 - 54	29.2	(26.3 - 32.3)
55 - 64	17.9	(15.4 - 20.7)
Gender		
Male	32.6	(29.9 - 35.5)
Female	38.1	(35.8 - 40.4)
Race/Ethnicity		
White non-Hispanic	32.0	(30.1 - 33.9)
Black non-Hispanic	54.0	(47.8 - 60.0)
Other non-Hispanic	41.6	(32.5 - 51.2)
Hispanic	32.3	(22.6 - 43.9)
Education		
< High school	33.9	(26.2 - 42.4)
High school grad	31.9	(28.6 - 35.3)
Some college	37.4	(34.2 - 40.7)
College grad	36.8	(33.8 - 39.9)
Household Income		
< $20,000	42.3	(36.6 - 48.1)
$20,000 - $34,999	41.4	(36.5 - 46.5)
$35,000 - $49,999	30.4	(26.0 - 35.2)
$50,000 - $74,999	35.2	(31.3 - 39.3)
≥ $75,000	36.1	(32.9 - 39.5)

[a] Among those aged 18-64 years the proportion who reported that they ever had been tested for HIV, apart from tests that were part of a blood donation.

Ever Tested for HIV Among Adults Aged 18-64 Years Michigan, 1998-2006
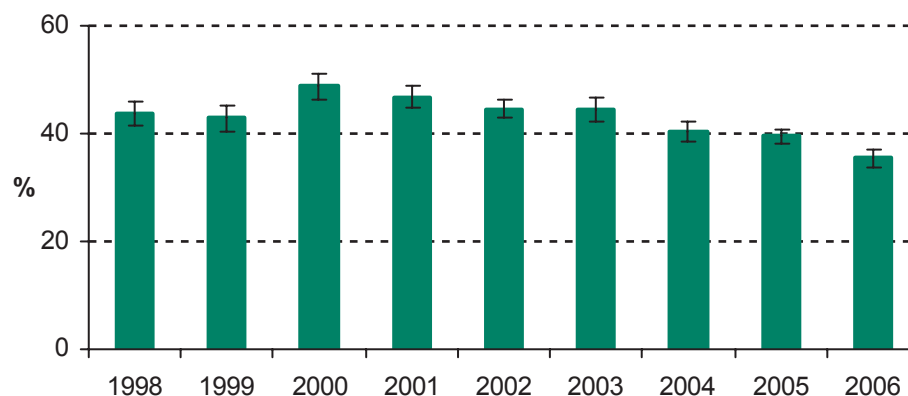
Asthma

Asthma is a chronic inflammatory disorder of the lungs, and is characterized by wheezing, coughing, difficulty breathing, and chest tightness. Asthma attacks can be triggered by a variety of factors, such as cold air, allergens, irritants, and respiratory viral infections. Allergies, a family history of asthma or allergy, low birth weight, and exposure to tobacco smoke are just a few potential risk factors that are associated with the development of asthma.[53-56]

In 2006, the estimated proportion of Michigan adults ever told by a health care professional that they had asthma was 14.0% and an estimated 9.5% of all Michigan adults currently had asthma. Women were more likely than men to have ever been told they had asthma (16.3% vs. 11.5%) and nearly twice as likely as men to have current asthma (12.0% vs. 6.8%).

Over the past seven years, the proportion of Michigan adults who reported ever having asthma has been relatively consistent with the U.S. median.

Demographic Characteristics	Ever Told Have Asthma[a]		Still Have Asthma[b]	
	%	95% Confidence Interval	%	95% Confidence Interval
Total	14.0	(12.9 - 15.1)	9.5	(8.6 - 10.5)
Age				
18 - 24	18.3	(13.8 - 23.7)	10.5	(7.2 - 15.1)
25 - 34	15.8	(12.7 - 19.4)	10.6	(8.1 - 13.8)
35 - 44	13.5	(11.4 - 16.0)	9.6	(7.8 - 11.8)
45 - 54	12.5	(10.6 - 14.7)	9.3	(7.7 - 11.1)
55 - 64	14.5	(12.3 - 17.0)	10.5	(8.6 - 12.8)
65 - 74	11.1	(8.8 - 13.8)	7.7	(5.8 - 10.2)
75 +	10.7	(8.4 - 13.4)	6.7	(5.0 - 9.0)
Gender				
Male	11.5	(9.9 - 13.3)	6.8	(5.6 - 8.2)
Female	16.3	(14.8 - 17.8)	12.0	(10.8 - 13.4)
Race/Ethnicity				
White non-Hispanic	13.4	(12.3 - 14.6)	9.2	(8.3 - 10.2)
Black non-Hispanic	13.6	(10.4 - 17.6)	8.8	(6.3 - 12.3)
Other non-Hispanic	21.7	(15.3 - 29.8)	14.2	(8.9 - 22.0)
Hispanic	17.8	(11.0 - 27.5)	12.6	(7.4 - 20.7)
Education				
< High school	19.1	(14.3 - 24.9)	14.9	(10.7 - 20.4)
High school grad	13.6	(11.8 - 15.6)	9.7	(8.2 - 11.4)
Some college	14.0	(12.1 - 16.3)	10.0	(8.3 - 11.9)
College grad	13.0	(11.2 - 15.0)	7.6	(6.3 - 9.1)
Household Income				
< $20,000	20.5	(17.0 - 24.5)	15.6	(12.6 - 19.2)
$20,000 - $34,999	14.9	(12.3 - 17.9)	10.6	(8.4 - 13.3)
$35,000 - $49,999	11.6	(9.3 - 14.3)	7.8	(6.0 - 10.2)
$50,000 - $74,999	13.5	(11.2 - 16.3)	9.1	(7.2 - 11.5)
≥ $75,000	12.2	(10.1 - 14.7)	6.8	(5.4 - 8.6)

[a] The proportion who reported that they were ever told by a doctor, nurse, or other health care professional that they had asthma.
[b] Among all respondents, the proportion who reported that they still had asthma.

Lifetime Asthma
U.S. vs. Michigan, 2000 - 2006
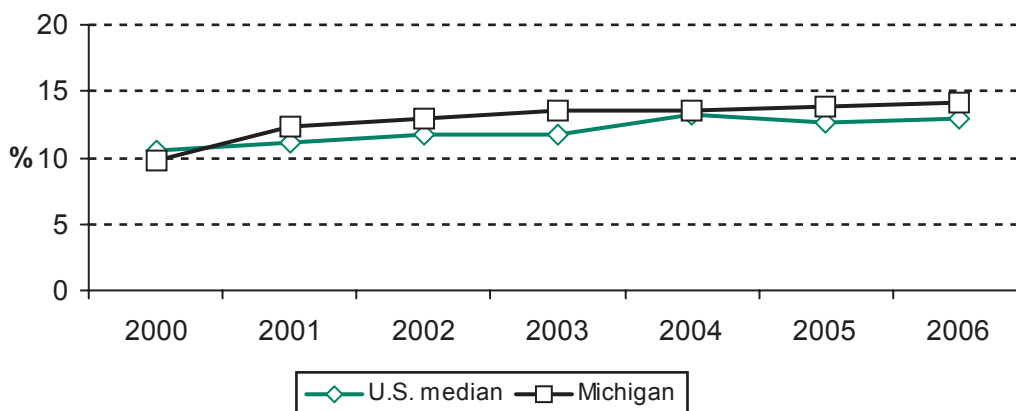
Cardiovascular Disease

Heart disease and stroke are leading causes of death in the United States for both genders and all racial-ethnic groups.[57] More than 287 thousand people die each year with heart failure and another 550 thousand new cases are diagnosed each year.[58] Cardio-vascular disease costs an estimated $300 billion annually.[57] Modifying risk factors offers the greatest potential for reducing death and disability from cardiovascular disease.[57]

In 2006, 4.9% of Michigan adults had ever been told they had a heart attack or myocardial infarction, 5.1% had ever been told angina or coronary heart disease, and 3.0% had ever been told stroke. All three indicator estimates of cardiovascular disease decreased with education and in-come, and increased with age. Men were more likely than women to have ever been diagnosed with a heart at-tack (6.4% vs. 3.5%).

Demographic Characteristics	Ever Told Heart Attack[a]		Ever Told Angina or Coronary Heart Disease[b]		Ever Told Stroke[c]	
	%	95% Confidence Interval	%	95% Confidence Interval	%	95% Confidence Interval
Total	4.9	(4.4 - 5.5)	5.1	(4.5 - 5.7)	3.0	(2.5 - 3.5)
Age						
18 - 34	0.5	(0.2 - 1.4)	0.1	(0.0 - 0.6)	0.6	(0.3 - 1.5)
35 - 44	1.3	(0.7 - 2.4)	1.3	(0.8 - 2.2)	1.4	(0.7 - 2.6)
45 - 54	3.3	(2.4 - 4.7)	4.5	(3.2 - 6.2)	1.6	(1.0 - 2.4)
55 - 64	8.8	(7.0 - 10.9)	9.5	(7.6 - 11.7)	5.3	(4.0 - 7.1)
65 - 74	13.0	(10.4 - 16.1)	13.3	(10.7 - 16.4)	7.2	(5.3 - 9.8)
75 +	18.3	(15.2 - 21.9)	17.9	(15.0 - 21.4)	10.1	(7.9 - 12.8)
Gender						
Male	6.4	(5.5 - 7.5)	5.8	(4.9 - 6.8)	2.9	(2.3 - 3.7)
Female	3.5	(3.0 - 4.2)	4.4	(3.8 - 5.2)	3.0	(2.5 - 3.6)
Race/Ethnicity						
White non-Hispanic	4.9	(4.3 - 5.5)	5.3	(4.7 - 6.0)	2.9	(2.5 - 3.4)
Black non-Hispanic	5.0	(3.4 - 7.3)	4.6	(2.9 - 7.2)	3.3	(2.0 - 5.3)
Other non-Hispanic	7.3	(4.1 - 12.5)	4.0	(2.1 - 7.7)	3.9	(1.7 - 8.8)
Hispanic	1.3	(0.4 - 4.4)	1.5	(0.5 - 4.2)	1.4	(0.4 - 4.7)
Education						
< High school	9.6	(7.1 - 12.9)	8.2	(6.0 - 11.1)	6.5	(4.5 - 9.5)
High school grad	6.3	(5.2 - 7.5)	6.6	(5.6 - 7.9)	3.6	(2.7 - 4.6)
Some college	4.3	(3.4 - 5.3)	4.3	(3.4 - 5.5)	2.7	(2.0 - 3.5)
College grad	2.8	(2.2 - 3.7)	3.4	(2.6 - 4.3)	1.6	(1.1 - 2.3)
Household Income						
< $20,000	11.6	(9.3 - 14.3)	9.3	(7.3 - 11.9)	7.8	(6.0 - 10.2)
$20,000 - $34,999	7.1	(5.6 - 8.8)	8.5	(6.9 - 10.5)	5.6	(4.3 - 7.4)
$35,000 - $49,999	4.1	(2.9 - 5.7)	4.3	(3.1 - 5.8)	1.6	(1.0 - 2.5)
$50,000 - $74,999	2.7	(1.9 - 3.9)	2.8	(1.9 - 4.0)	1.0	(0.6 - 1.8)
≥ $75,000	2.1	(1.4 - 3.2)	2.9	(2.0 - 4.0)	1.2	(0.7 - 2.0)

Among all adults, the proportion who had ever been told by a doctor that: [a] they had a heart attack or myocardial infarction, [b] they had angina or coronary heart disease, or [c] they had a stroke.

Cardiovascular Disease by Gender Michigan, 2006
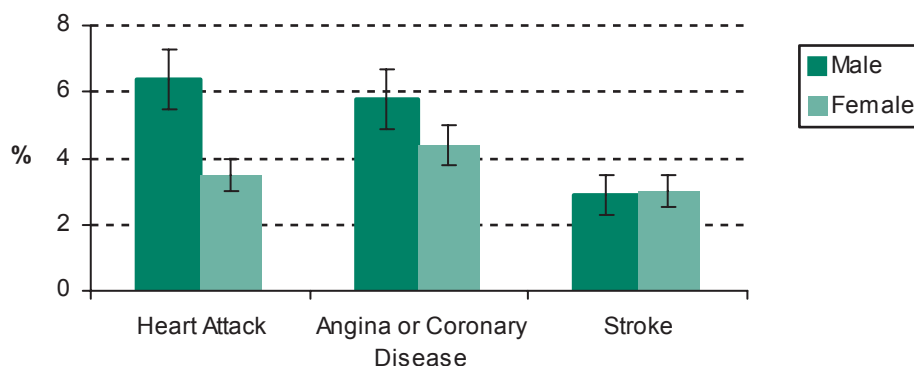
Diabetes

Diabetes mellitus is a chronic disease characterized by high glucose levels, owing to insufficient production of insulin by the pancreas or to a reduction in the body's ability to use insulin.[59-60] In Michigan, diabetes was the sixth leading cause of death with 2,846 individuals in 2005 and was considered the primary cause in 3.3% of all deaths.[49] Obesity, poor diet, physical inactivity, and high blood pressure are just a few risk factors that are associated with the increase in diabetes prevalence.[59-60]

In 2006, an estimated 9.0% of Michigan adults had ever been told by a health care professional that they have diabetes. This prevalence increased with age from 0.4% of those aged 18-24 years to 22.3% of those aged 65-74 years. The proportion of those who had diabetes declined with increasing education and income levels.

In Michigan, there has been an increase in the prevalence of diabetes between 1997 and 2006, and Michigan's prevalence estimate has been consistently higher than the U.S. median for most years. During this same time period, the prevalence of obesity, a risk factor for diabetes, has also been increasing in the U.S.[60] and in Michigan.

Michigan adults who were obese were more than two and a half time as likely as those who were overweight and over seven times as likely as those who were not overweight or obese to have diabetes in 2006 (19.1% [17.0-21.4], 7.0% [5.9 -8.2], 2.6% [2.0-3.4] respectively). The estimated prevalence of diabetes among those who were obese has been consistently higher than those who were overweight and those who were not overweight or obese since 1997.

Nearly 40% (39.5% [37.9-41.2]) of Michigan adults had been checked for diabetes in the past year. This proportion was higher for women than men (35.0% [32.4-37.6] vs. 43.7% [41.6-45.8]).

Demographic Characteristics	Ever Told Diabetes [a]	
	%	95% Confidence Interval
Total	9.0	(8.2 - 9.8)
Age		
18 - 24	0.4	(0.0 - 2.5)
25 - 34	1.1	(0.4 - 2.9)
35 - 44	5.8	(4.3 - 7.7)
45 - 54	8.5	(6.8 - 10.5)
55 - 64	18.4	(15.9 - 21.2)
65 - 74	22.3	(18.9 - 26.2)
75 +	17.7	(14.7 - 21.3)
Gender		
Male	9.7	(8.4 - 11.1)
Female	8.4	(7.5 - 9.3)
Race/Ethnicity		
White non-Hispanic	8.3	(7.6 - 9.2)
Black non-Hispanic	12.3	(9.5 - 15.8)
Other non-Hispanic	11.0	(6.9 - 17.1)
Hispanic	8.8	(4.3 - 16.9)
Education		
< High school	14.0	(10.8 - 18.0)
High school grad	10.9	(9.5 - 12.6)
Some college	8.3	(7.0 - 9.8)
College grad	6.2	(5.0 - 7.5)
Household Income		
< $20,000	15.7	(12.9 - 19.0)
$20,000 - $34,999	12.6	(10.6 - 14.9)
$35,000 - $49,999	9.3	(7.4 - 11.8)
$50,000 - $74,999	5.9	(4.5 - 7.8)
≥ $75,000	4.6	(3.5 - 6.0)

[a] The proportion who reported that they were ever told by a doctor that they have diabetes. Adults who had been told they have prediabetes and women who had diabetes only during pregnancy were classified as not having been diagnosed.

Diabetes
U.S. vs. Michigan, 1997-2006
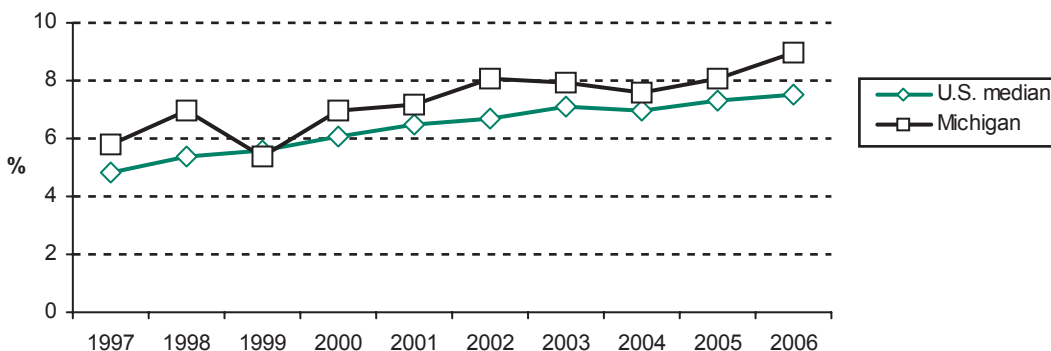
The national Behavioral Risk Factor Surveillance System (BRFSS) consists of annual telephone surveys conducted independently by the states, District of Columbia, and U.S. territories and is coordinated through cooperative agreements with the Centers for Disease Control and Prevention (CDC). The annual Michigan Behavioral Risk Factor Surveys (BRFS) follow the CDC protocol for the BRFSS and use the standardized English core questionnaire. The 2006 Michigan BRFS data were collected quarterly by the Institute for Public Policy and Social Research at Michigan State University. The sample of telephone numbers was selected using a list-assisted, random-digit-dialed methodology with disproportionate stratification based on listedness.

The 2006 Michigan BRFS data were weighted to adjust for the probabilities of selection (based on the probability of telephone number selection, the number of adults in the household, and the number of residential phone lines) and a post-stratification weighting factor that adjusted for sex, age, and race (using 2005 estimated Michigan population distributions with bridged race categories).[61]

Prevalence estimates and asymmetric 95% confidence intervals (CIs) were calculated using SUDAAN (version 9.01), a statistical computing program that was designed for analyzing data from multistage sample surveys.[62] If the CIs for two estimates from different subpopulations (e.g., males and females) did not overlap, they were assumed to be statistically different. In addition, selected pair-wise comparisons were tested for statistical significance using a t-test or chi-square. Although results of these statistical tests are not reported, they were used to guide the presentation of results.

Unless otherwise specified, respondents who answered that they did not know or refused to answer were not included in the calculation of estimates.

For comparison purposes, the median of estimates from all participating states and territories was used as a national estimate. All 50 states, two territories (Puerto Rico and the Virgin Islands), and the District of Columbia participated in the 2006 BRFSS.

Sample Results for the 2006 Michigan BRFS

A total of 48,030 telephone numbers were used for the 2006 Michigan BRFS. The total number of eligibles was 8,344, of which 5,662 resulted in a completed or partially completed interview; 28,572 were ineligible; and 11,114 were of unknown eligibility.

The CASRO (Council of American Survey Research Organizations) response rate is a measure of respondent contact and cooperation. This rate includes completed interviews and partial interviews in which at least 50 percent of the core questionnaire has been completed in the numerator and an estimate of the number of eligible units in the sample in the denominator (including a proportion of the unknowns). The CASRO response rate for the 2006 Michigan BRFS was 52.4%.[63]

Health of the Michigan BRFS

The CASRO rate for Michigan BRFS has increased or held steady in the recent past, at a time when the median of CASRO rates for other states has been dropping. The survey contractor, Office of Survey Research in the Institute for Public Policy and Social Research at Michigan State University, has worked diligently to improve the CASRO rate.


CASRO Rate
U.S. Median vs. Michigan, 1990-2006
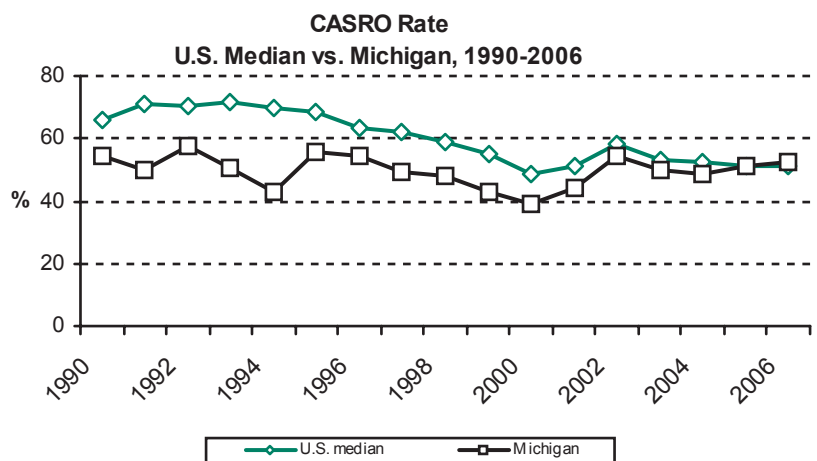
In addition, MDCH has recently been able to increase the number of interviews each year. A larger sample size increases the utility of the survey by providing more precise estimates, allowing for increased number of topics to be covered each year, and enabling the calculation of estimates for more demographic and geographic subpopulations. For example, single year estimates were calculable for Hispanic adults for the first time in 2005, because the large sample size allowed for adequate number of completed interviews in this group. Although it is doubtful that the 2005 experience will be repeated, it is important to maintain a sample size of 6,000 or more completed interviews each year.

Number of Interviews
Michigan BRFS 1987-2007
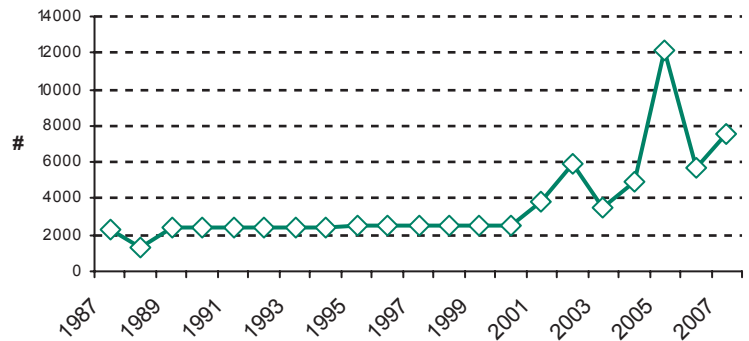
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